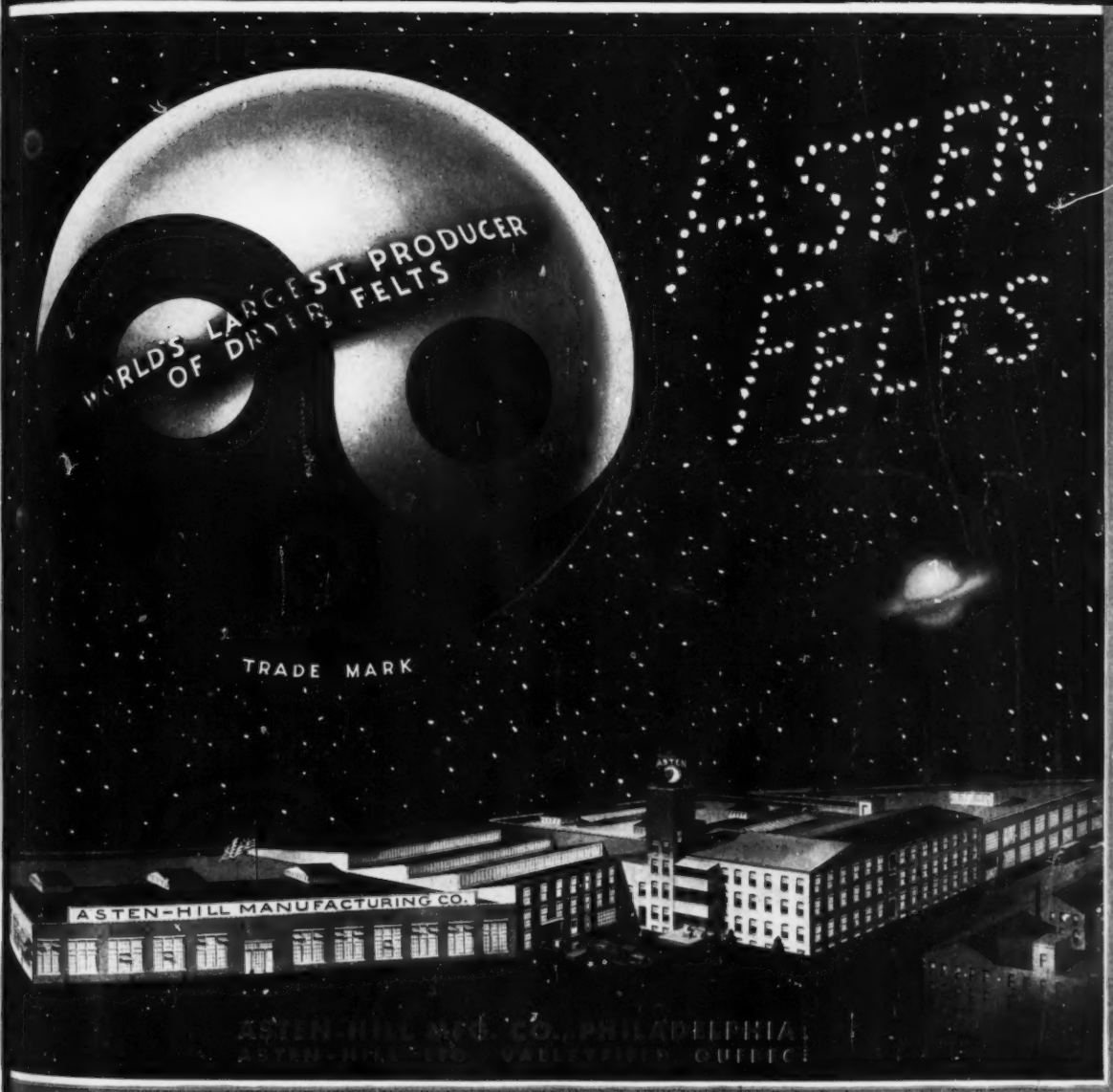
# PAPER TRADE JOURNAL

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD




DEC. 23 1937

Vol. CV
No. 26

# DOWNINGTOWN

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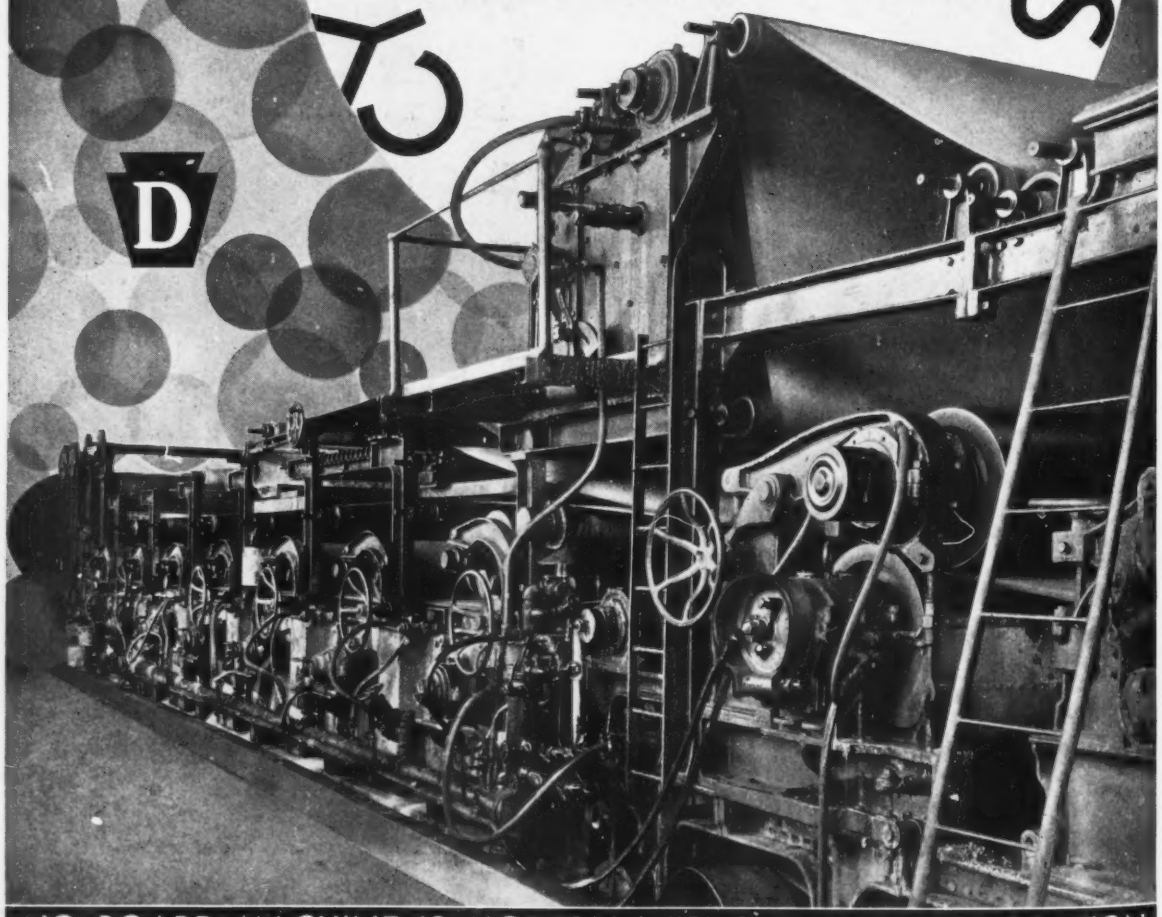

NO BOARD MACHINE IS MODERN WITHOUT DUO-DEHYDRATION


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# PAPER TRADE JOURNAL

THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD

Published Every Thursday by the LOCKWOOD TRADE JOURNAL CO., Inc.

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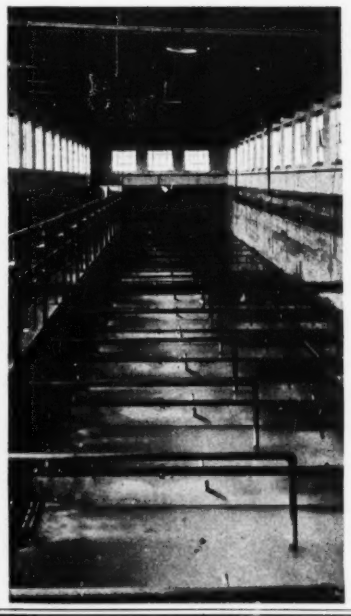
# IT IS GOOD BUSINESS TO SELECT NORWOOD FILTERS



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## MODERN PAPER MACHINE DRIVES

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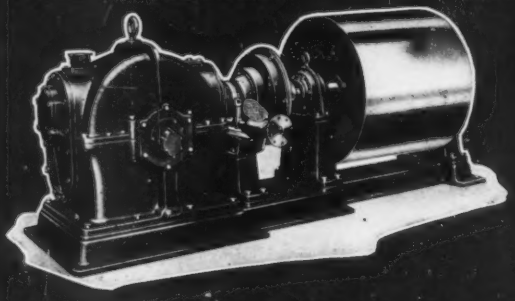

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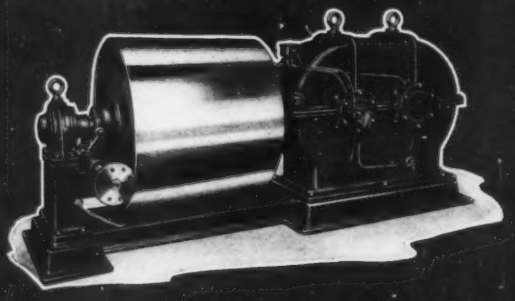

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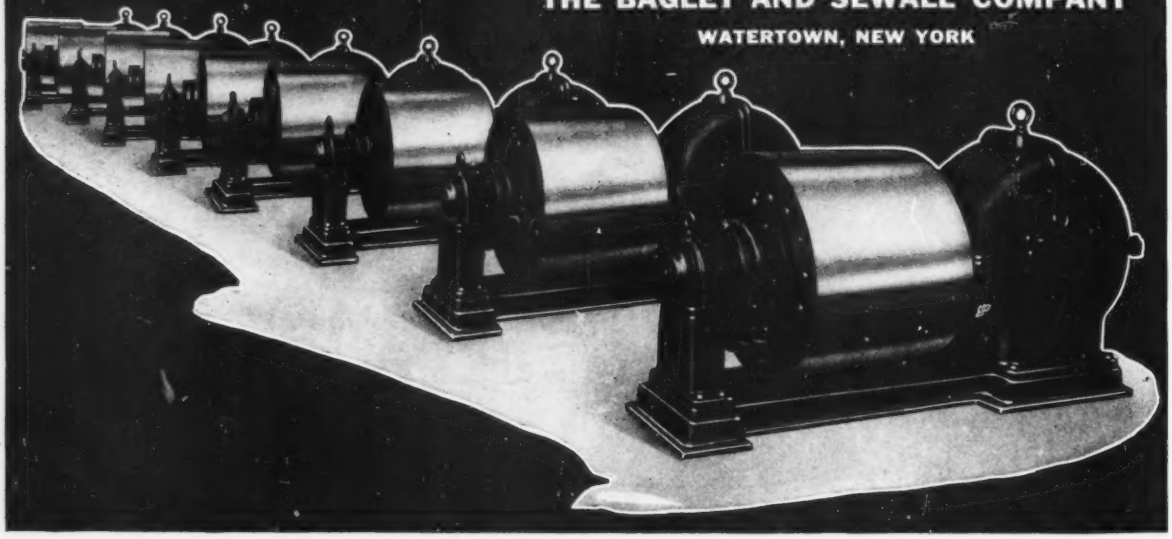

# PAPER TRADE JOURNAL

Reg. U. S. Pat. Off.

SIXTY-SIXTH YEAR

PAPER

Established Feb. 17, 1899
Consolidated Nov. 16, 1899
with Paper Trade Journal.

Vol. CV, No. 26 Thursday, December 23, 1937

PAPER

Established Sept. 21, 1918
Consolidated Feb. 19, 1925
with Paper Trade Journal.


# Newsprint Output Larger Than Last Year

## Production of Canadian Mills In November 6 Per Cent Higher Than November 1936 — Curtailment of Newsprint Expected In January — Pulpwood Cut Reduced — Fighting Sawfly Destruction — Other News

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., December 20, 1937—Production of newsprint from Canadian mills in November did not show as large a contraction as had been anticipated in view of the fact that most of the larger companies had been working on a 5-day week during the month. The total output, 302,236 tons was about 6 per cent larger than in November, 1936, but less by 3.2 per cent than in October. The reduction in operating time as compared with October was over 16 per cent, and the apparent discrepancy between the two percentages is largely explained by the fact that the month saw a sizeable gain in the capacity of at least two importing companies. Shipments at 335,777, exceeding production by nearly 11 per cent was in line with expectations. It is anticipated that this month's shipments will show a further expansion, but that they will nosedive during January, when the higher price will be in effect, and will remain at a low level for several months until publishers, their accummulated stocks used up, will return to a normal delivery basis. It is also thought that in January a 4½ or even a 4-day operating schedule may be in force.

It is noteworthy that at the annual meeting of the Bank of Montreal—at which, by the way, L. J. Belnap, president of the Consolidated Paper Corporation, was elected a director—the President, Sir Charles Gordon, said that the outlook in the newsprint industry was not clear, and that those newsprint companies which were thinking of adding new machines would do well to bear this in mind.

### Large Cut in Restigauche Area

A survey of the situation in New Brunswick would seem to indicate that in the Restigouche district, in northern New Brunswick, the largest cut in the province will be made consequent upon a contract with the Ontario Paper Company, whilst at present it would seem that the cut of pulpwood for the plant of the New Brunswick International Pulp Company at Dalhousie, N. B., and that for the Bathurst Power and Paper Corporation will run about average. These operations will be centered in northeastern New Brunswick but, on the other hand, the cut in the Miramichi district, also in the north-eastern area, is likely to be much less than that of last season. As regards the Saint John River district operations are expected to be restricted. In Victoria County it is expected Frasers Ltd., will cut about 5,000,000 of long lumber.

Of course all this may be altered by changing conditions in the international area and a straightening out of matters of moment among the nations and curtailment of war activities might very conceivably bring back conditions to at least normal especially in the matter of freight rates.

### Fighting Sawfly Destruction

Reports as to continued destruction in the forests by the European spruce sawfly continue to come from the Maritime Provinces. The matter was considered at a meeting of the Maritime section of the Canadian Society of Forest Engineers at a meeting in Fredericton, N. B., recently. It was reported that the Minister of the New Brunswick Department of Lands and Mines had promised to assist the society in combating the pest. The Department, he said, had completed arrangements to provide sufficient funds, in co-operation with some of the larger operating companies, to aid the Dominion Entomological Branch in securing as many parasites as possible for liberation in New Brunswick during the coming season. It has been arranged to increase the number liberated in the province to something like 40 million in 1938. This work has been going on for the past two or three seasons, 10,000,000 being liberated in 1937.

Although it is still in a more or less experimental stage it is recognized that parasite liberation is the only method which at the present time offers a chance of control of the outbreak.

At the meetings of the committee the value of an aeroplane in the transportation of parasites to less accessible areas was discussed. The private plane of the Hon. F. W. Pirie was used for this purpose on one occasion last year and is expected to be available for use in this work during the coming season. The use of a plane permits the living parasites to be taken rapidly to the point of liberation and thereby diminishes the danger of loss of these valuable insects through their being kept in the containers during a lengthy journey over woods roads.

# Kraft Industry Meeting Reflects Optimism

## Leaders At Kraft Paper Assn's. Important Midwest Meeting More Optimistic of Future — Salesmen's Ass'n Hear Bishop Stewart — Paper Mill Container Costs — Paper Board Production — Other Late News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., December 20, 1937.—An important meeting of the kraft industry held here this week under the auspices of the Kraft Paper Association, is reported to have engendered some optimism and strengthened the belief of local observers that this market will remain firm with a better outlook in the near future. Otherwise, local lines were colorless from a news standpoint with demand slow and buyers showing little interest until after inventory and obviously until the national business condition evidences a definite trend.

Groundwoods and newsprints seemed to be the brightest spots locally with waste papers, on the other hand, evidencing a picture of near stagnancy. Groundwoods found mills running at approximately 80 per cent with other lines, comparatively, running from 50 to 60 per cent capacity. Newsprint representatives still felt the benefit of pre-price increase buying. Fine papers in general were little changed with sulphites holding firm in a narrow range. Books and covers were about the same. Paperboard markets were quiet though the total yearly production of the industry evidenced a real improvement during the twelve months period.

### Salesmen's Ass'n. Hear Bishop Stewart

Bishop George Craig Stewart, head of this diocese of the Episcopal Church and chaplain of the Salesmens Association of the Paper Industry, gave his annual message to the midwest division last Monday, December 13. Approximately sixty salesmen and guests were present to hear one of the stirring messages for which Dr. Stewart is nationally noted. The head of the Church, himself a business man with business responsibilities in church investments, dwelt on the shaken and disturbed position of the world, pointed to the almost certainty of war in Europe sooner or later, expressed optimism over the future of America and declared that he was "sold on this country." Dr. Stewart drew a fascinating picture of the building of roads as the indispensable factor of importance in the development of civilization and projected a Christmas message in the comparison of the road building achievements of Augustus Caesar which led to Bethlehem and to a world movement observed by millions while the greatest of the Caesars' is forgotten.

The Salesmen will hold their annual Christmas party on December 29 with Ben Babbitt again in charge of the festivities and the elder member of the Coy family ready to lead the singing program.

### Paper Milk Container Costs

Substitution of paper milk containers for glass bottles makes possible a savings of 2½ cents a quart in retail milk deliveries and of one cent in wholesale deliveries according to R. W. Bartlett, assistant chief of the agricultural economics college of the University of Illinois. Mr. Bartlett has been making a study of milk delivery costs which shows plant expenses for processing and bottling milk in paper containers as about half those involving the use of bottles. Labor, space, equipment and power necessary for handling washing and storing bottles were factors cited in the saving. The use of paper containers also reduced the delivery man's load of 61 pounds to 28 pounds for a case of 12 quarts of milk according to the findings of Mr. Bartlett's investigation. This resulted in a speeding up of service through elimination, also of picking up empty bottles. The cost of the container, however, was reported as averaging 1.34 cents a quart as compared with one tenth of a cent for the glass bottle.

As a result of this cost angle, an officer of a Chicago milk dealer's supply house has said that the high figure made him doubt the ultimate consumers would find much savings on their milk bills. He added that the machinery necessary for the manufacture of paper containers would prove too expensive for most dairies. This same milk dealer has reported knowing of only two concerns which have tried paper milk containers and that one has returned to the glass type of container. The study provided by Mr. Bartlett is considered as a challenge to the paper industry to cut, if possible, the cost of the paper container.

### Paperboard Production at Low of Year

Local reports indicate that paperboard production in the United States is just about at its low for the year. October production announced by 99 manufacturers in the United States amounted to 334,619 tons, the smallest for any month this year but still larger than for any month in 1936 with the exception of October, 1936, when 359,849 tons were produced. Unfilled orders at the end of October were 88,775 tons, based on department of commerce reports, as compared to 108,467 tons at the end of September and 138,830 tons at the end of October, 1936. In the first ten months of 1937 the industry produced 3,776,885 tons of paperboard against 3,008,474 in a like period of 1936 and 2,756,171 in the first ten months of 1935. The 1937 output has already exceeded the entire 1936 output inasmuch as total 1936 production reached only 3,658,871 tons. November and December production, normally slow, will not add to the total materially but enough to make 1937 considerably in excess of 1936. In October the paperboard industry was operating at 68½ per cent of capacity against 81.1 per cent for the first ten months of the year as compared to 73.2 per cent in all of 1936 and 67 per cent for the year 1935.

### Service Angle Rewards Swigart

After nearly two months of trial, the Swigart Paper Company reports that its "Gallery of Printed Ideas," formally opened on November 1, 1937, has been well worth the effort. Created and maintained by the Swigart organization as a source of helpfulness to printers and printing-planners for the "man who faces a blank page," the Gallery remains open from 9 to 5 on each week day except Saturday with

supervisors in constant attendance. A reference file of 7000 actual printed pieces is available with 125 classifications by product, idea and format. There is a special exhibit of timely specimens changed monthly.

### Midland Features Kimberly-Clark Paper

"By air, sea or rail," says the Midland Paper Company division of the Zellerback Paper Company, "Hyfect's unusual opacity cuts mailing costs." The most recent folder describing the Kimberly-Clark Corporation book papers, presents some attractive illustrations of modes of travel and ties up the theme with the light weight perfection of Hyfect which becomes ideal "when mailing weight is of importance." Hyfect is produced in both Super and English finish and in all standard weights and sizes. The broadside is printed on Hyfect English Finish, 25 x 38-70 pound basis.

### Swigart Adds "Red Silverflake" To Lines

The Swigart Paper Company, 717 S. Wells street, Chicago, has recently announced the addition of Red Silverflake to go as a companion paper with Silverflake, "The paper of the stars." Red Silverflake made, as is the Blue Silverflake, by the Strathmore Paper Company, also comes in three other colors and in two weights. Flat Stock and announcement papers are also available in the popular line which is being widely used in advertising entertainments, winter merchandise and other special events.

### Crocker-McElwain Kit Favorably Received

A letterhead sample kit from Crocker-McElwain Company is making quite an impression in Chicago paper circles. The four pocket brochure contains about twenty smartly designed specimens of letterheads of quality and a clever freshness which is not lost on the business firm desirous of keeping up with the times. The "idiograph" type is a feature of the sample kit.

Worthy of passing on to all the paper trade is the item in "Paper Progress" stating that "if you are an average citizen you consumed 226 pounds of paper last year—more, in fact than any other substance that enters your life with the exception of water and milk. From the various mercantile stores came about 83 pounds of paper. About 57 pounds of newspapers were in the total and about 21 pounds of book paper in the magazines. The average consumer also received 8½ pounds of fine papers, mostly letters and advertisements.

## Recommends Types of Flood Walls

HOLYOKE, December 20, 1937.—Of considerable interest to many Holyoke Paper manufacturers who suffered severe flood damages in 1936, was the announcement this week that an extensive report had been submitted to Congress by Secretary of War Woodring, containing very definite recommendations for the locations and types of flood walls to be constructed along the Connecticut River at Holyoke. The report covers the entire program proposed for the Connecticut River and the part interesting Holyoke stipulates that the Federal government construct the dikes and pumping sations necessary at an estimated cost of $1,388,000 and the cost to the municipality to cover land and intercepting sewers to be approximately $147,000. The total length of the dikes will be 17,400 feet.

## South To Honor Dr. Herty

The eyes of the nation will be focused on quaint, little Fernandina, Fla., January 14 when leading industrialists, financial and editorial figures gather as guests of Florida's Governor Fred P. Cone to pay tribute to the work of a distinguished Georgia scientist, Dr. Charles Holmes Herty. By executive proclamation Governor Cone established this date to apprise all Florida industries of the growing importance of the Southeastern states' hundred million dollar new kraft paper enterprises, resulting largely from pioneering research and pine cellulose utility begun seven years ago by Dr. Herty.

The first unit of the Container Corporation of America's $9,000,000 Fernandina mill will be formally launched at this date when Walter P. Paepcke, Container's president unveils a plaque inscribed to Dr. Herty. Secretary of Commerce Roper will share speaker's honors for the occasion with James G. Stahlman, president of the American Newspaper Publishers Association, and Florida's energetic young Senator Claude Pepper. According to plans developed by Col. Fred Bradshaw, Jacksonville, and Col. Harold Colee, president of the Florida State Chamber of Commerce, aides to the Governor, the State's distinguished guests will be welcomed at Jacksonville, proceed thence to view a parade of historic pageantry sponsored by the City of Fernandina, events featured later by dedication ceremonies at the new paper mill. At Jacksonville the group will be guests at a state banquet where Governor Cone will be host.

In addition to New York, Chicago and Washington guests, Governor Cone has invited the Governors of eight southern paper producing states to take part in the day's activities described as a symposium on the new southern industry. Nation-wide radio broadcasts will carry the news of the day throughout the country.

## Cut Pulpwood at Tupper Lake

[FROM OUR REGULAR CORRESPONDENT]

TUPPER LAKE, N. Y., December 20, 1937. — Large quantities of pulpwood are being cut in the great Whitney tract, a few miles from here, this fall and the final journey to paper mills in Northern New York was started this week. In sharp contrast to the old logging days, trucks now chug into this village under huge loads of pulpwood consigned to the Dexter Sulphite, Pulp and Paper Company. At the site of the old railroad station workmen are kept busy transferring the logs to freight cars and these are moved swiftly out with the cargo that will keep the mills busy this winter. More than 20,000 cords of pulpwood were cut on the Whitney tract, about 13,000 cords of which will be transported by rail to Dexter. The remaining 7,000 cords will be transported by water in the traditional river drive. Following the breaking of the ice next spring the logs will be rafted down Tupper Lake, Round Pond and over foaming Bog River Falls into Big Tupper Lake. Motor boats will tow the pulpwood through the winding channel into Raquette Pond then to Underwood where it will be loaded into cars for shipment to the mills. At the peak of the pulp cutting operations more than 200 men were at work in four large camps on the Whitney tract.

# Paper Industry Shows Employment Stability

## Wisconsin Commission Reports Out of 2 Million Reserve Only .7 Per Cent Was Used In Unemployment Payments, Against 4.7 Per Cent For Other Industries — Patent Granted For Seam In Paper Mill Wires.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., December 20, 1937. — Greater stability of employment has been shown in the paper industry of Wisconsin than in most other industries, tabulations by the Wisconsin Industrial Commission of the employer reserve accounts of the Wisconsin Unemployment Insurance Act indicate. Out of approximately $2,000,000 contributed to these reserves by 61 paper and paper products manufacturers since the act took effect three years ago, only $8,365 was paid out in unemployment benefits during the first year of actual operation of the fund from August, 1936 to June, 1937. This represents .7 per cent, as compared with the state average of 4.7 for all industries.

### Patent Granted for Seam in Paper Wires

Otto Abendroth of Appleton, Wis., superintendent of the International Wire Works, Menasha, Wis., has been granted a patent for his method of producing a seam in paper mill wires. It involves trimming the warp wires, removing one wire and substituting for it a fuse wire. Heat is applied to the fuse wire, melting it and causing it to adhere to the wires on each side. The patent was applied for April 19 and was approved as to two claims. The inventor has made no assignment of commercial rights. This is one of several patents granted to Mr. Abendroth over a period of time in the wire industry.

### Rhinelander Gives Christmas Bonus

Five-hundred employees of the Rhinelander Paper Company, Rhinelander, Wis., are being given a Christmas bonus amounting to two per cent of their wages. An extra dividend of two per cent also was declared to stockholders.

### Conway Heads Manufacturers Assn.

Joseph M. Conway, president of the Hoberg Paper Mills, Inc., Green Bay, Wis., was elected president of the Wisconsin Manufacturers Association at its annual convention last week at Milwaukee, Wis. He succeeeds D. Clark Everest, vice-president and general manager of the Marathon Paper Mills Company, Rothschild, Wis. Walter J. Kohler, chairman of the board of the Kohler Company, Kohler, Wis., and former governor of Wisconsin, was one of the principal speakers. He characterized the business recession as a "painful relapse" from recovery caused by uncertainty and confusion as to the future. George E. Sokolsky, writer and lecturer, told the convention that "political unionism" is on the wane in the United States. "The CIO is not dead," he said. "but its vitality is gone. Our problem is to prevent collective bargaining from becoming a political instrument that would destroy industry."

### Goodwille Speaks on Equipment

J. C. Goodwille of the Beloit Iron Works, Beloit, Wis., spoke on new developments in paper machine manufacture at the monthly meeting of the Lake States section of the Technical Association of the Pulp and Paper Industry Tuesday, December 14. His talk followed a dinner at Conway hotel at Appleton, Wis. He showed several films picturing the success of the more recent improvements on paper machines, and demonstrated a model of a removable type of Fourdrinier. T. C. Roberts, another member of the firm, assisted with the demonstration.

### Christmas Party at Kimberly-Clark Mill

Employees of the Lakeview mill of the Kimberly-Clark Corporation, Neenah, Wis., are holding a Christmas party at the mill on Friday, December 24. A turkey dinner will be served, and a dance and five-act floor show will follow. Forty girls of the home economics classes of the Neenah high school will serve the dinner. Girls employed in the company's main office held a dinner and bridge party at Valley Inn last week.

### Koon and Stiegler Nuptials

Charles Koon, research assistant at the Institute of Paper Chemistry, Appleton, Wis., and Miss Elizabeth Ashe, daughter of William F. Ashe, personnel director of the Thilmany Pulp and Paper Company, Kaukauna, Wis., were married Saturday afternoon, December 18, at the Brokaw Memorial Methodist Church at Kaukauna. The bride was employed at the Institute also. Mr. and Mrs. Koon will reside at 222 E. Washington St., Appleton, Wis.

Ralph H. Stiegler, employed in the Kimberly-Clark Corporation mill office at Niagara, Wis., and Miss Ethel Wege of Neenah, Wis., were married Saturday, December 11, at St. Paul English Lutheran Church at Neenah. They are on a honeymoon trip to Chicago and points in Michigan and will reside at Iron Mountain, Mich.

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### The Story of Newsprint Paper

The "Story of Newsprint Paper" prepared by R. S. Kellogg, secretary of the News Print Service Bureau, 342 Madison Avenue, New York City, continues to have a world-wide distribution. As an evidence of this fact, it may be mentioned that in the past few days an order was received for fifty copies to go to New Zealand.

The book has previously had a large sale in Australia, a good many copies have gone to South Africa and individual requests continue to come in from all over the map.

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### The Betz Indicator

The Betz Indicator—A monthly publication on Water Conditioning—will be mailed without cost or obligation to Chief Engineers and other Steam Plant Executives, upon their written request to W. H. & L. D. Betz, Chemical Engineers and Consultants on all water problems, 235 W. Wyoming Ave., Philadelphia, Pennsylvania.

# Financial News of Pulp and Paper Industry

Collins Mfg. Co. Files Petition For Reorganization — Robert Gair Co. Passes Dividend On Preferred Stock — Crystal Tissue Sues To Recover Taxes — Champion Wins Rate Decision Case — Other Financial News.

### New York Stock Exchange

High, Low and Last for the Week Ending December 22, 1937

| | High | Low | Last |
|---|---|---|---|
| Armstrong Cork Co. | 38⅞ | 36½ | 37½ |
| Celotex Corp. | 26 | 25¼ | 25⅜ |
| Celotex Corp., pf. | 59 | 59 | 59 |
| Certain-Teed Products Corp. | 8¼ | 7⅜ | 7¾ |
| Certain-Teed Products Corp., pf. | 31 | 28 | 29½ |
| Champion Paper & Fibre Co. | 32⅛ | 31 | 32 |
| Champion Paper & Fibre Co., pf. | 104½ | 104 | 104½ |
| Congoleum-Nairn Co. | 23¼ | 21 | 21¾ |
| Container Corp. of Amer. | 14½ | 12¼ | 13½ |
| Continental-Diamond Fibre Co. | 7¾ | 7½ | 7½ |
| Crown-Zellerbach Co. | 11⅜ | 10⅛ | 10⅛ |
| Crown-Zellerbach Co., pf. | 65¾ | 64 | 64 |
| Flintkote Co. | 18⅜ | 16 | 17 |
| Robert Gair | 4⅛ | 3⅞ | 3⅞ |
| Robert Gair, pf. | 14⅞ | 13½ | 14¼ |
| International Paper & Power | 10⅛ | 8½ | 8⅝ |
| International Paper & Power, pf. | 40⅜ | 37 | 37¾ |
| Johns-Manville Corp. | 89 | 80 | 86½ |
| Johns-Manville Corp., pf. | 121 | 121 | 121 |
| Kimberly-Clark Corp. | 20¼ | 20 | 20¼ |
| MacAndrews & Forbes | 31 | 31 | 31 |
| Masonite Corp. | 35¾ | 34¼ | 34¾ |
| Mead Corp. | 13¼ | 12 | 12 |
| Mead Corp., pf. | 66½ | 54 | 66½ |
| Paraffine Companies, Inc. | 39½ | 37½ | 39½ |
| Ruberoid Co. | 23 | 21½ | 22½ |
| Scott Paper Co. | 38½ | 36¾ | 38½ |
| Sutherland Paper Co. | 20⅜ | 19⅞ | 20½ |
| Union Bag & Paper Corp. | 10⅜ | 9⅛ | 9⅛ |
| United Paperboard Co. | 4⅞ | 4⅜ | 4⅜ |
| Taggart Corp. | 4¼ | 4⅛ | 4⅛ |

### New York Curb Exchange

High, Low and Last for the Week Ending December 22, 1937

| | High | Low | Last |
|---|---|---|---|
| American Box Board Co. | 8¼ | 8½ | 8½ |
| Brown Co., pf. | 30 | 27 | 27 |
| Great Northern Paper | 32 | 32 | 32 |
| St. Regis Paper Co. | 3½ | 3⅛ | 3⅛ |
| St. Regis Paper Co., pf. | 64 | 64 | 64 |
| Taggart Corp. | 4⅛ | 4⅛ | 4⅛ |

## Collins Mfg. Co. Files for Reorganization

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, December 20, 1937.—The Collins Manufacturing Company of North Wilbraham has filed a petition for reorganization under Section 77B of the Federal Bankruptcy Act in Federal Court in Boston. It is seeking to preserve its present cash on hand and to provide new working capital.

The Collins Manufacturing company was operated for many years by the late S. R. Whiting of Holyoke and is now operated by his family. The petition was authorized by the directors December 11 and upon filing with the court, the present management was ordered continued in possession. It is hoped that the mill which has operated for the past 50 years will continue employing its present force of 150. Attorney John S. Begley of Holyoke who prepared the petition, stated that the company has been enjoying good business and had a number of orders on hand at the present time. Liabilities are placed at $927,744 and assets at $649,251.

This is the second time within a few weeks that the Collins Manufacturing Company has figured prominently in the news. Only the week prior to the filing of the petition, final authorization was given by the Governors Council to the Metropolitan Water Supply Commission to make payment to the Collins Manufacturing Company a principal sum of $300,000 (three hundred thousand dollars) and interest of $14,000 (fourteen thousand dollars) for damages resulting to the company from water diversion in the Ware-Swift River Valleys where a huge reservoir is being constructed for the metropolitan system.

The claim for damages, originally a much larger amount, has been in controversy for 28 months and following a recent court decision and favoring opinions by the State's Attorney General, the council authorized the payment with interest at 2 per cent rather than 6 per cent as claimed. Lieut. Gov. Francis E. Kelly was the only dissenter.

This award was made prior to the preparation of the petition under 77B and is included in the assets of the company.

The company at present is manufacturing high grade bond and ledgers and several years ago for two years manufactured one third of the government currency paper, sharing the contract with the Crane company of Dalton.

The company's major liability is the round sum of $700,000 owing to the S. R. Whiting estate. The officers are, President, Samuel Whiting of Holyoke, son of the former owner; Treasurer, Paul C. Best of Springfield; Secretary, James Whiting of Holyoke, also son of the former owner.

## Robert Gair Defers Dividend

E. Victor Donaldson, president of the Robert Gair Company under date of December 13 sent the following notice to stockholders of the company:—"At a meeting held December 10, 1937, the Board of Directors of your company decided to defer action in respect to the fourth quarterly dividend on its Preferred Stock. In reaching this decision, the Directors were influenced by many considerations. These included the present level of business, the existence of bank loans and the present condition of the new issues markets.

"As stated in the 1936 annual report, dated February 19, 1937, your company incurred bank loans in the amount of $2,000,000. Much of this credit was obtained for the purpose of participating in the construction of a plant at Plymouth, N. C., in order to reduce materially the cost of sulphate pulp, none of which will be available this year. The balance of this credit was needed for plant rehabilitation, as well as to finance increased inventories and receivables.

"Since a substantial part of the proceeds of these loans was used for capital expenditures, the Management took steps to refund them on a long term basis. The condition of the securities markets which has prevailed prevented this possibility. As a consequence, your Directors have concluded that prudent policy dictates the necessity for the conservation of the resources of the Company pending a clarification of the outlook.

## Crystal Tissue Seeks to Recover Taxes

CINCINNATI, Ohio, December 20, 1937.—The Crystal Tissue Company, paper manufacturers on the outskirts of Middletown, Ohio, filed a suit against the

United States yesterday seeking to recover $1,858 paid in as capital stock taxes. Part of the tax was paid for the year ending June 30, 1933, under the NRA and part for the year ending June 30, 1934, under the Revenue Act of 1934. A claim for refund was rejected by the Bureau of Internal Revenue. The petition alleges that sections of the laws under which the taxes were collected are unconstitutional.

## Champion Wins Rate Decision

[FROM OUR REGULAR CORRESPONDENT]

DAYTON, Ohio, December 20, 1937.—The Champion Paper and Fibre company of Hamilton, Ohio, won a decision from the Interstate Commerce commission today, which will permit the paper mill to ship wood pulp from its Houston plant to Hamilton at greatly reduced rates.

The commission permitted the railroads serving the Hamilton concern to charge a 30 per cent per 100 pound rate on wood pulp in carloads, without observing the long and short haul provisions of the Interstate Commerce act, over routes no more than one-third circuitous. The regular class rate to central territory points is 67 cents.

The railroads asked the lowered rate to permit them to compete with water and truck competition, which had offered the Hamilton company a combination rate of 25.5 cents a 100 pounds. The Champion representative at hearings before the commission testified, however, that his company would rather pay a slightly higher rate, such as the 30-cent fee, for all rail movement than for a combined water-truck route, even at a lower rate.

Some 50,000 tons of pulp annually are shipped from the Houston pulp mill to Hamilton, about 100 carloads a month, it was stated. The water route suggested was from Houston to Cincinnati and by truck the remaining distance, but this meant delay, slow movement and is not as convenient as the rail shipment, it was pointed out. The 30-cent rate, the commission found, would be sufficiently compensatory to the railroads in such an exceptional case.

## Files Suit To Recover Taxes

[FROM OUR REGULAR CORRESPONDENT]

DAYTON, Ohio, December 20, 1937.—The Crystal Tissue Company, of North Excello, Friday filed suit in U. S. District Court in Cincinnati to recover $1,858 in capital stock taxes paid the Federal Government in 1933 and 1934. The petition filed by the local concern alleged that laws under which the taxes were collected were unconstitutional.

A previous request for refund was denied by G. T. Helvering, commissioner of internal revenue.

## Wisconsin Public Service Profits Up

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., December 20, 1937.—Reports issued by the Wisconsin Public Service Corporation last week showed net income for the fiscal year ending October 31 of $1,456,574. This was $370,522 more than the net income reported for 1936.

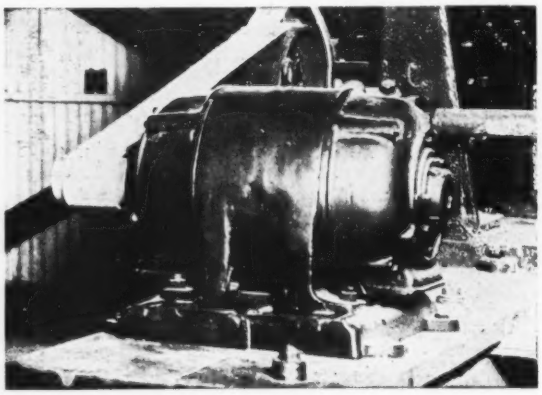
## Badger Paper Mills Vote Dividend

Badger Paper Mills, Inc., voted a year-end payment of $1.30 a share on the common stock, payable December 21. A disbursement of 50 cents was made on October 25.

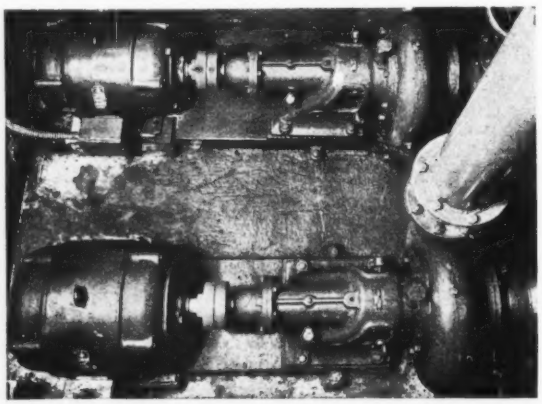
## Install F-M Motors at Vernon

When new paper making machines were installed at the California-Oregon Paper Mills, Vernon, Cal., Fairbanks-Morse motors were selected to power them. During the past few years many F-M motors and motor-driven pumps have been installed in this plant, and all are rendering excellent service.

A 100-hp. synchronous motor with a 70-per cent leading power factor and another 200-hp. synchronous motor with an 80-per cent leading power factor have enabled the company to obtain power factor rebates from the power company. These rebates have varied from $180 to $240 per month, an excellent return on the investment.



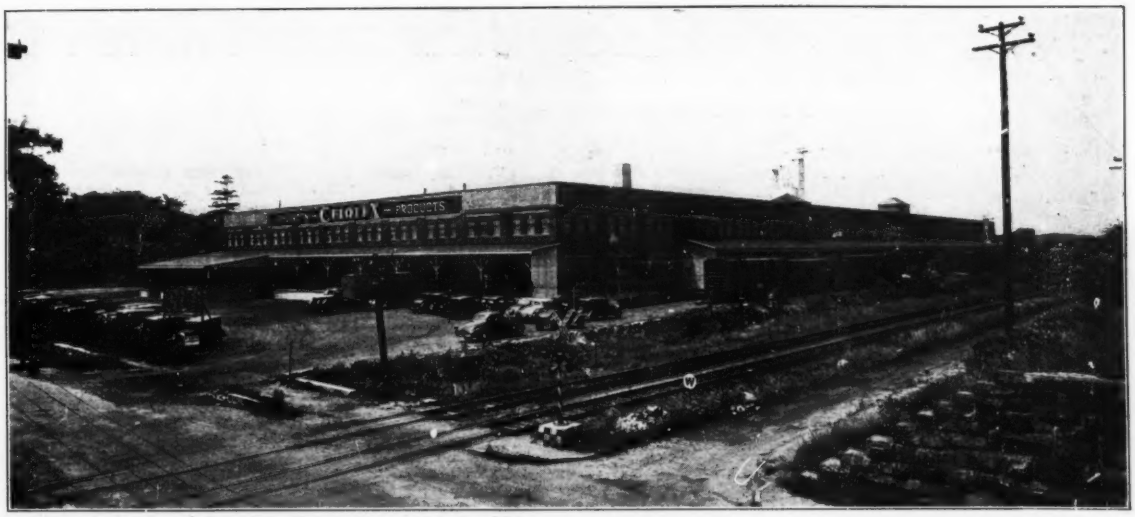
WHILE THE MAIN DRIVE OF THE PAPER MACHINE IS A STEAM ENGINE, AUXILIARIES ARE DRIVEN BY MOTORS. AN F-M MOTOR IS SHOWN ON A STOCK SCREEN.



TWO F-M MOTOR-DRIVEN FIG. 6710 PAPER PULP PUMPS. ONE DELIVERS 1000 G.P.M. AT 40-FT. HEAD AND THE OTHER 1500 G.P.M. AT 33-FT. HEAD.

## Rust Engineering Co. Built Crossett Mill

Owing to an inadvertence an entry in one of the charts on the new mills in the South printed in the issue of the PAPER TRADE JOURNAL of November 25, 1937 made it appear that the plant of the Crossett Paper Mills at Crossett, Ark., was built by Merritt, Chapman & Scott. This error is greatly regretted as it is, of course, well known that this mill was built by the Rust Engineering Company, Pittsburgh, Pa.




# Celotex Opens Plant at Metuchen, N. J.

Installation of machinery and equipment in the new Celotex plant recently acquired at Metuchen, N. J., has been completed, and the plant is in production on a line of Traffic Top Products and Cemesto.

### Traffic Top Products

Traffic Top Products comprise Celotex Traffic Board, especially designed for use as a cushion under wood block flooring, as a protection for waterproofing and damp-proofing courses, and for other similar purposes, and Celotex Promenade Traffic Top for use as a surface on roofs, play courts, aisleways, and other surfaces subjected to foot traffic and exposed to the outside weather. This product, in addition to turning a roof into a useful promenade, also adds years of life to the regular roof beneath it; Celotex Mil-flor Traffic Top is especially adapted for medium duty traffic surface for factory floors, but is not recommended where floors are subjected to excesses of oil, or in heavy industry plants subjected to severe abuses from abrasion by heavy machinery parts.

### Made from Ferro Treated Celotex

These products are all made from Ferro-treated Celotex cane fiber insulation board which has been impregnated with special bitumens to provide the required toughness and hardness.

Promenade Traffic Top is available in green, red, and black, or unpainted, with beveled edges. Celotex Traffic Top Products are 12 inches wide, and vary in length from 12 to 48 inches. Celotex Traffic Board is 24½ by 48½ inches.

Celotex Cemesto is Ferro-treated Celotex cane fiber insulation board, waterproofed and then surfaced on one or both sides with ⅛-inch layers of asbestos-cement. It is particularly recommended for interior and exterior wall construction either in homes, factories, garages, filling stations, cabins, and is unusually suitable for industrial construction.

### Erected and Equipped at Cost of $1,250,000

The Celotex plant at Metuchen, N. J., was erected and equipped at a cost of approximately $1,250,000. It is located about halfway between Philadelphia and New York on a Lehigh Valley spur, and is close to the main line of the Pennsylvania R. R. Its shipping equipment includes truck and railroad loading platforms, with close access to storage areas.

## Reserve Water Power of Campbell River

[FROM OUR REGULAR CORRESPONDENT]

VANCOUVER, B. C., December 18, 1937.—Waterpowers of Campbell River, Vancouver Island, one of the great potential sources of electricity on the Coast of British Columbia, have been reserved until September 1, 1939, in favor of the Vancouver Island Power Company, associate of the B. C. Electric Railway Company, the Legislature learned today.

First intimation that the company had been granted an extension of its holdings on the river was given to the Legislature by Hon. Wells Gray, minister of lands, in answer to C. C. F. questions. Mr. Gray said the extension had been granted because the company's plan to construct a hydro-electrical plant had been halted, the demand for power not warranting construction at this time. No public notice was given by the company of its intention to apply for an extension of time, and no public enquiry held before the extension was granted, Mr. Gray stated.

President W. G. Murrin of B. C. Power Corporation says there is no significance in his company's action in extending the reserve. It is merely routine procedure. The company has a considerable investment in the Campbell River rights, having made extensive surveys there, and for that reason did not feel inclined to let the reserve go by default.

It is understood that the only probable development in that part of the province that would justify a hydro-electric project there would be establishment of a pulp or paper plant. This was contemplated about seven years ago, but nothing has transpired in that connection recently.

# Government Paper Bids and Awards

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 22, 1937.—The Enterprise Paper Company has been awarded the contract for furnishing the Government Printing Office with 25,350 pounds (150,000 sheets) of 28 x 41 dull coated book paper at 7.7 cents per pound, bids for which were received on November 26.

The Whitaker Paper Company will furnish 8,000 pounds (50,000 sheets) of 19 x 24 white blotting paper at 5.85 cents per pound, bids for which were received on November 24.

Barton, Duer & Koch Paper Company will furnish 36,288 pounds (1,008,000 sheets) of 14 x 20, 50 per cent rag, litho finish map paper at 11.67 cents per pound. The same firm will also furnish 6,700 pounds (50,000 sheets) of 38 x 48 blue finish book paper at 11.67 cents per pound and the Mathers-Lamm Paper Company will furnish 21,525 pounds (150,000 sheets) of 21 x 32 50 per cent rag, white ledger paper at 11.11 cents per pound.

The Printing Office has received the following bids for 18,240 pounds (114,000 sheets) of 38 x 48 dull coated book paper; Stanford Paper Company, 7.85 cents and 8 cents; Whitaker Paper Company, 7.85 cents and 7.52 cents; John F. Post, Inc., 8.92 cents; Barton, Duer & Koch Paper Company, 7.85 cents; and R. P. Andrews Paper Company, 7.83 cents.

For 175,000 pounds of supercalendered book paper: R. P. Andrews Paper Company, 5.57 cents; Marquette Paper Company, 5.57 cents; Stanford Paper Company, 5.57 cents; Perkins Goodwin Company, 5.57 cents; John F. Post, Inc., 5.57 cents; Whitaker Paper Company, 5.57 cents; Barton, Duer & Koch Paper Company, 5.57 cents; Paper Corp. of U. S., 5.57 cents and 5.5 cents; Reese & Reese, Inc., 5.57 cents; and Cauthorne Paper Company, 5.57 cents.

For 120,000 pounds of newsprint paper in 24 inch rolls: National Pulp & Paper Company, 2.5 cents; Old Dominion Paper Company, 2.649 cents; Paper Corp. of U. S., 3 cents; and Stanford Paper Company, 3.6 cents.

For 855 sheets of white and buff sulphite index paper: Whitaker Paper Company, $2.50 (white), $2.80 (buff) per C sheets less 2 per cent; and Stanford Paper Company, $5.75 for either.

For 16,700 pounds (100,000 sheets) of No. 2 kraft wrapping paper; R. P. Andrews Paper Company, 4.42 cents per pound; Stanford Paper Company, 4.48 cents (rolls only); Import Paper Company, 4.55 cents; Whitaker Paper Company, 4.42 cents; Barton, Duer & Koch Paper Company, 4.42 cents; Reese & Reese, Inc., 4.32 cents; Mathers-Lamm Paper Company, 4.51 cents; Walker, Goulard Plehn Company, 4.27 cents; Andrews Paper House of York, Pa., 4.39 cents; James F. Walsh Paper Corporation, 4.75 cents; and W. L. Jones, Inc., 4.4 cents.

For 85,000 pounds of No. 2 kraft wrapping paper in rolls: R. P. Andrews Paper Company, 4.18 cents; Stanford Paper Company, 4.28 cents; Import Paper Company, 4.30 cents; Whitaker Paper Company, 4.18 cents; Barton, Duer & Koch Paper Company, 4.18 cents; Reese & Reese, Inc., 4.09 cents; Mathers-Lamm Paper Company, 4.27 cents; Walker, Goulard Plehn Company, 4.02 cents; Marquette Paper Company, 4.18 cents; Andrews Paper House of York, Pa., 4.14 cents; James F. Walsh Paper Corporation, 4.5 cents and W. L. Jones, Inc., 4.15 cents.

## Price Level Well Maintained

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., December 20, 1937.—As far as the paper business in this territory is concerned, there is very little and the trade is convinced there will be only sporadic orders until after inventory. In spite of the continued handicap of hand to mouth buying, the price level is being well maintained and there are no present indications of any weakness. Jobbers and manufacturers say stocks have been well balanced with demand and there apparently is little distress merchandise to be dumped, hence the continued price level. They contend there has been little, if any overproduction in the trade and the present business recession is not due to this factor. They also contend that stocks in consumers' hands are very light and the first inkling of returning business will see a small-sized rush to the market.

A disappointment during the past two weeks has been the slump in wrapping paper and bag demand. The one bright spot in the picture continues to be the steady demand for newsprint. Seasonal influences have caused some increase in lineage over the entire area and demand is fully as good as last year. Prices show no change.

Container men and converters are taking a little hope in the fact that glass factories in this territory have increased production and some of them have sufficient business to last well into next year. Most of the glass bottles from here are shipped already in containers to food manufacturers, distillers and other users and the glass industry has increased its takings. Some demand continues to come from the candy makers, but in most other instances, demand is none too good.

Paper stock men report only a fair demand for better grades of paper and rags. Paying prices have held up well in face of a low mill demand.

## Veldown Reorganizes Sales Dept.

[FROM OUR REGULAR CORRESPONDENT]

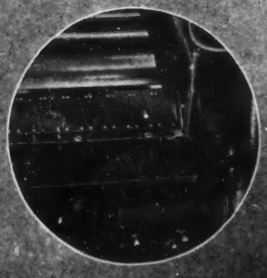
GLENS FALLS, N. Y., December 20, 1937. — A movement is under way for a reorganization of the sales department of the Veldown Company, Inc., manufacturers of paper tissue, and this week several salesmen in various parts of the country, including two from the Pacific Coast, met at the plant and received instructions from J. E. Blosser, assistant to the president and general manager. Later in the week 20 more salesmen gathered at the plant for further sales discussions after which they were assigned to the several sales areas into which the country is being divided under the new plan. Previously, the salesmen reported directly to the company's offices in New York City but under the new plan reports will be made to the district heads who will in turn make their district reports to the main office. E. K. Hunt, of New York, has been designated as sales manager.

CLEAN ROLLS
FEWER BREAKS
FEWER REJECTS
MIRROR SURFACES
NEVER SCORES ROLLS
REDUCED FRICTION
NO LEAKING
STOPS STREAKING
NO MORE WIRE RIDGES
ELIMINATES SHOWERS
FEWER PICK-UPS
SAVES STEAM
NO FUZZ OR DIRT
KEEPS STACKS RUNNING
STOPS CALENDER MARKS
LESS ROLL SANDING

Whatever the reason back of any given Vickery Doctor installation you can be certain that the Vickery Doctor is engineered to give you maximum results at lowest cost per year. . . . Let us show you why this is true for any roll in your mill.

BIRD MACHINE COMPANY • SOUTH WALPOLE • MASS.

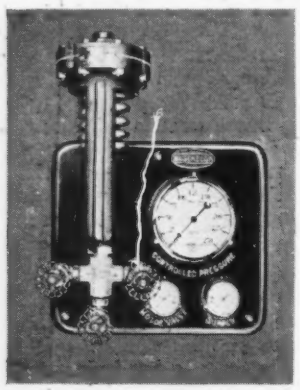
Vickery Doctors



YOU CAN MAKE MORE MONEY WITH NEW BIRD MACHINERY

## New Pressure Controller

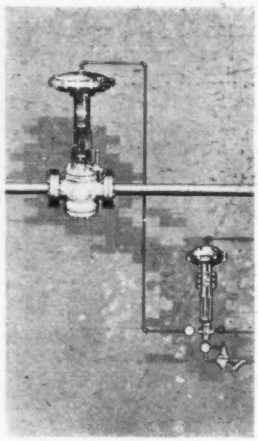
The Syncromaster Pressure Controller recently announced by Mason-Neilan Regulator Company, is a simplified hydraulic operated combination of pilot mechanism and a diaphragm actuated control valve of the latest, most advanced design. The unit was developed to improve control and to reduce installation and maintenance costs by eliminating the inconvenience and potential trouble inherent in chains, weights, levels, etc. common to the old style combination regulator, which incorporated a chain connected balanced valve and hydraulic cylinder. Very stable and accurate control is obtained because of the full throttling features of pilot and control valves. The latter is the same valve developed for the exacting requirements of instrument controlled systems.



PANEL MOUNTING

Operation is hydraulic, using any external supply of 20 to 150 lbs. pressure. Since the pilot bleeds only when control valve diaphragm pressure is reduced, water consumption is low, resulting in economical operation.

The controlled pressure is piped to the pilot valve diaphragm and is balanced by the setting of the springs. Increases or decreases in this pressure move the piston valve to increase or decrease the control valve diaphragm pressure positioning the valve plug to maintain the required pressure in the system. In operation the control valve plug is in a "floating" position, moving only sufficiently to maintin the required flow of the controlled medium.



WALL MOUNTED SYNCROMASTER

Pilot construction features include self-aligning spring buttons to prevent binding; thrust ball bearing of stainless steel for easy accurate spring adjustment; stainless steel ball bearing guides; lap-type piston valve of 18-8 stainless steel, multiple springs for sensitivity and positive action. The pilot may be mounted on wall or panel or directly on the control valve. Control valve features include ball bearing guides; use of 18-8 stainless steel for all parts subject to friction and corrosion; streamlined parabolic centroguide valve plugs; pressure lubricator. Either normally open or normally closed valves may be used.

The Syncromaster Pressure Controller may be used anywhere accurate, positive regulation is required. A variety of standard pressure ranges are available between 1 and 265 lbs. Special ranges up to 750 lbs. are also available. Equipment for differential pressure service up to 1500 lbs. static pressure may also be furnished.

## Fifty Years of Paper Making

Paper has been a dominant factor in the progress of civilization, and a large portion of its contribution has been the work of the West Virginia Pulp and Paper Company, in both the printing industry and in the development of the art of paper making. *Fifty Years of Paper Making,* a forty page booklet recently prepared by the company, portrays the advancement that has occurred since 1888 at which time the construction on the mill at Luke, Md., commenced.

Information of much interest can be noted throughout the pamphlet:—

By means of a chart and accompanying explanation, the section on modern paper making presents a clear analysis of pulp and paper manufacture from the raw materials to the finished product.

For the past thirty years, the West Virginia Pulp and Paper Company has produced approximately one-seventh of all the paper generally referred to as "book papers" consumed in the United States.

Its mills have an aggregate capacity of 1400 tons of pulp and 1550 tons of paper and board.

For the fiscal year ending October 31, the production of all its papers showed an increase from 239,085 to 440,000 tons since 1927, an increase of 42 per cent.

The five hundred acre site on which the new mill at Charleston, S. C., is situated, is occupied on a fifty year, dollar-a-year lease from the city of Charleston, with a renewal option at expiration for another fifty years.

The main office of the West Virginia Pulp and Paper Company is located at 230 Park avenue, New York City.

## Andrews To Start De-Inking Plant

The Silco Pulp Products Company, 1836 Euclid avenue, Cleveland, Ohio, announced that its first commercial De-inking unit is about ready to begin operation at the paper mill of the O. B. Andrews Company, Chattanooga, Tenn. The Silco Pulp Products Company has made a number of test runs all of which have been very satisfactory and have shown that this system will commercially de-ink all grades of waste paper at a low cost.

The plant of the O. B. Andrews Company will go on a production schedule of de-inking waste paper about January 15. Mills interested in inspecting this plant or in securing information of the process should communicate with E. H. Silberman, president of the Silco Pulp Products Company.

## Cleveland Surveys Industrial Supplies

CLEVELAND, Ohio, December 20, 1937.—The Cleveland Chamber of Commerce is instituting a survey of Cleveland industries to determine what industrial supplies and materials are used, in quality in the city, but not produced locally. It is stated that the survey will include an inquiry into the manufacture of paper as well as paper products. Mr. Clifford Gildersleeve, Industrial Commissioner, is in charge of the survey.

# BELOIT IRON WORKS

BELOIT WISCONSIN

## Scott Paper Golf Assn. Hold Banquet

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., December 20, 1937. — The Scott Paper Golf Association held its first annual banquet, climaxing the initial season's activities on the fairways and greens last Thursday night. C. William Duncan, Philadelphia columnist, the principal speaker, addressed the group of 50-odd golf enthusiasts on some of his many experiences with the headline personalities in the world of sports, stage and business.

Prizes for prowess in the summer tournament of the Association were presented by W. F. Mohan, second vice-president of the company. These prizes were as follows: Willard Abbott, surf rod; Edward Sohoney, pipe; William Remorenko,, Levi McCormick, George Sension, Jason Runion, Roy Van Riper and Martin Cunniffe, each a box of shirts; Paul Feeser, golf balls; George Paulding, golf bag; Bruce Gilmore, shirts and gloves; D. B. Wilkinson, sweater.

N. Wilson Cady is president of the association; Ralph Figgs is vice-president; and George Paulding is secretary.

## Asks Newsprint Investigation

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 22, 1937.—An investigation into the alleged newsprint monopoly has been asked of the Attorney General by Senator Pope, of Idaho. Cummings has answered the Senator that such an investigation is already under way.

It may be recalled that early last summer one of the southern publishers asked for such an investigation and it has been going on in a desultory sort of way ever since that time.

In his letter to the Attorney General, the Senator asked him to give his "earliest consideration" to reports that "monopolistic practices" are skyrocketing the price of newsprint paper. The Senator stated that publishers in his state have advised him that prices being charged are higher than can reasonably be justified or accounted for unless "it is subject to monopolistic practices."

## C. H. Morian Heads Cherry River Co.

Clarke M. Morian, formerly manager of sales of the Cherry River Paper Company, Philadelphia, Pa., has been elected president of the company, succeeding Fred L. Space, deceased. Morian has been associated with the company for 13 years.

J. M. S. Ewing was chosen to fill the post formerly occupied by Morian.

Fred L. Dakin, president of the Cherry River Boom and Lumber Company, was named a vice president of the paper company, and E. E. Lord, vice president of the boom and lumber company, was chosen treasurer of the paper company.

Walter Briggs was re-elected secretary of the paper company.

## Said to Have Dropped Salt Cake Case

WASHINGTON, D. C., December 22, 1937.—While no formal decision has been rendered it is understood that the Customs Bureau, Treasury Department, has dropped the complaint of the dumping of salt cake on the United States market from Germany. It is said that the case was dropped because of insufficient evidence.

## Recent Customs Action on Paper

Customs officials at New York have classified shipments of Scandinavian envelope kraft paper and Kraft twisting paper for duty at 30 per cent as paper not specially provided for, not admitting the shipments as wrapping paper at 20 per cent under the Finnish and Swedish reciprocal trade agreements.

At Jacksonville a large importer of Kraft bag paper has refused to accept the Customs valuation and has been forced to give bonds—probably nearly $250,000—to secure the release of his paper. In addition, if the courts sustain the action of the Collector of Customs, he will face penal duties of approximately $50,000.

Investigation by the Import Committee of the American Paper Industry at various Atlantic and Gulf ports indicates that there have been advances in recent months in the foreign prices for various pulp boards. The Finnish market price for wood pulp pie plate board has increased from $32 to $38 per ton. The Finnish value of laminated pulpboard is the same as for the solid sheet, indicating that the foreign value on which duty is collected is not the ruling export price, though sales are apparently made at the above low figures for the small quantities used in the Finnish market, to establish a low base for computation of duties on the far larger quantities used in the Finnish market, to establish a low base for computation of duties on the far larger quantities sold for export.

Recent importations of beer mat board also indicate an advance in price in the foreign market.

Action of Customs officials in imposing duty on the basis of the cost of production on shoe counter board imported from Germany, instead of on the actual sale price has been followed by an increase in the delivered price of this board of about $10 per ton.

## Wrapping Paper Group Meets

[FROM OUR REGULAR CORRESPONDENT]

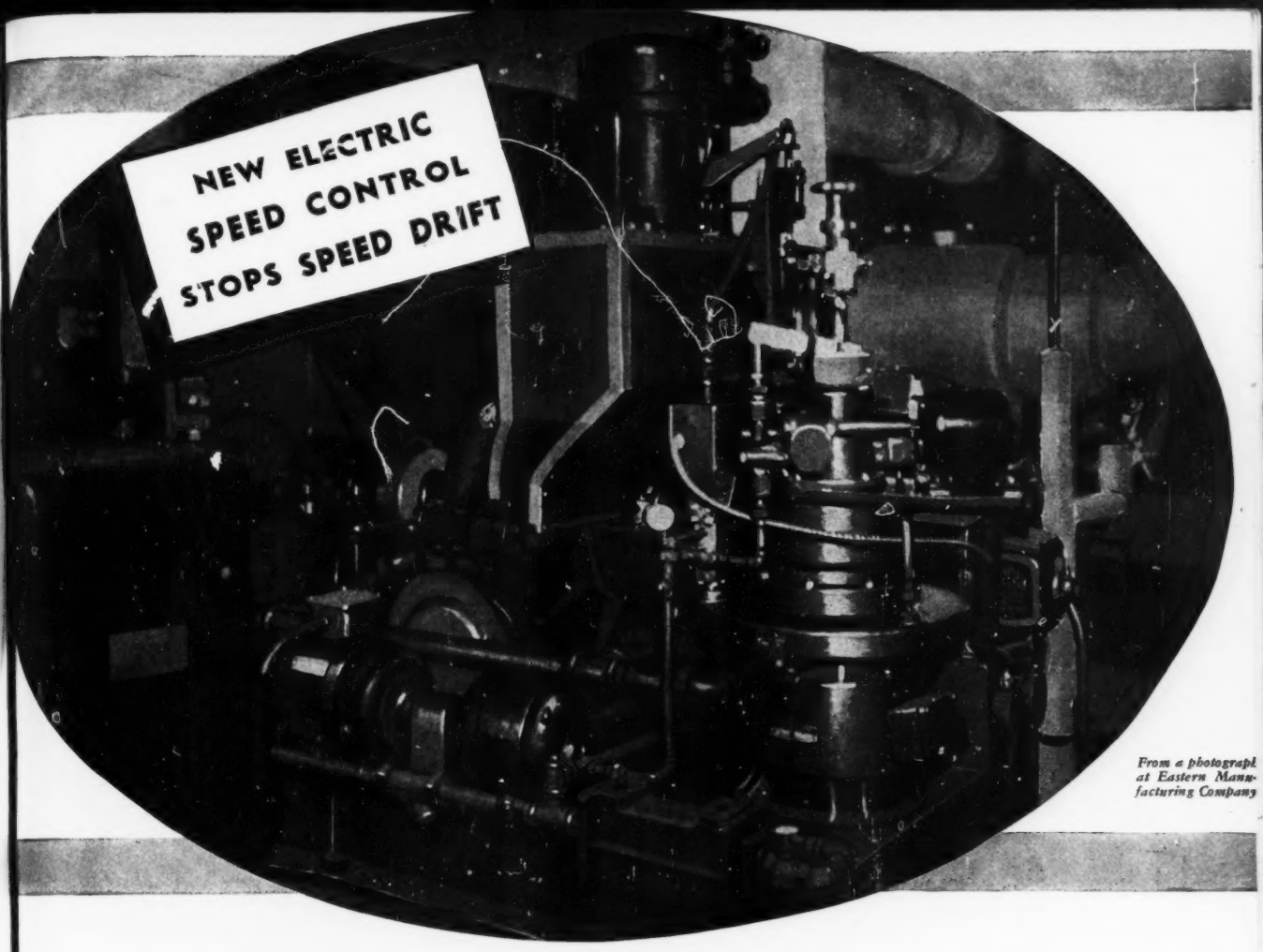
BOSTON, Mass., December 20, 1937.—At the luncheon meeting of the Wrapping Paper Group held Friday at the Boston Chamber of Commerce, it was voted to call a meeting of credit managers of the merchants who take part in the program of the Cost Finding Committee. The meeting, which is to be held December 21 at the Boston Chamber of Commerce, is for the development of practical steps for mutual protection against credit losses, undue extension of credit, and unfair tactics by buyers. The meeting will be under the leadership of John C. Hurd, executive secretary of the New England Paper Merchants Association.

Chairman Floyd H. Blackman presided, with ten houses represented.

## Union Bag Mill Resumes at Hudson Falls

[FROM OUR REGULAR CORRESPONDENT]

HUDSON FALLS, N. Y., December 20, 1937.—Operations were resumed this week at the Fenimore and Allen branches of the Union Bag and Paper Company. One machine was started at the Fenimore plant but it is not known when the second machine will be placed in operation. A leading official declared that he looks for the return of the paper manufacturing business to normal about the middle of January. Dr. Karl R. Karlson is now acting as resident manager here.




*From a photograph at Eastern Manufacturing Company*

# This Turbine Has the New Electric Governor

ONE setting of the electric speed control—and this 350-horsepower G-E turbine drives the paper machine at constant speed for the duration of the run. Eastern Manufacturing Company, South Brewer, Maine, does not find it necessary to tolerate speed "drift" and poor regulation due to temperature changes. The electric governor provides more than the required degree of accuracy. The same control precision extends over the entire 6:1 speed range. A more uniform product has been the result. In addition the turbine has effected important operating savings. Records for the first 14 months of turbine operation show a material reduction in maintenance and lubrication costs.

*THE electric governor is a revolutionary new speed control for paper-machine turbines—a development of the G-E small-turbine engineering department.*

*A turbine specialist from your nearest G-E office can supply further details on the new electric governor and on turbines for paper mills. Or write for Bulletin GEA-2615. General Electric, Schenectady, New York.*

720-277

GENERAL ELECTRIC

# CONSTRUCTION NEWS

***A Summary of Vital Facts Regarding Construction, of Pulp and Paper Mills***

## General Construction News

**Buffalo, N. Y.**—The Wagner Folding Box Corporation, 1534 Bailey avenue, manufacturer of folding paper boxes and containers, has approved plans for one-story addition to plant at 1621-23 Broadway. A building permit has been issued and work will be placed under way soon. No estimate of cost has been announced.

**Mobile, Ala.**—The National Gypsum Company, 190 Delaware avenue, Buffalo, N. Y., manufacturer of wall board and kindred products, has awarded contract to the Rogers Structural Steel Company, Corry, Pa., for structural steel framing for new mill at Mobile, previously referred to in these columns, to be used exclusively for the production of fiber board products for insulating service. The order totals about 300 tons of steel shapes, to be used for main production unit. It is proposed to begin superstructure work early in 1938. Entire project will cost close to $1,000,000, including equipment. The H. K. Ferguson Company, Hanna Building, Cleveland, Ohio, is general contractor for plant. Jere Massey will be works manager at mill.

**Louisville, Ky.**—Fire recently damaged a portion of the Premier Paper Company, Eighth and Main streets, general paper products, comprising a four-story building used in part for storage and distribution. Loss is reported over $35,000, including equipment. Plans for rebuilding are under way and work is expected to begin soon.

**Chicago, Ill.**—The Central Waxed Paper Company, 5659 West Taylor street, manufacturer of waxed and other processed papers, will defer the erection of proposed new addition to plan, previously referred to in these columns, until the spring of next year, when it is proposed to carry out project as initially planned. New unit will be one-story and basement, and is reported to cost close to $45,000, including equipment. Shaw, Naess & Murphy, 80 East Jackson Boulevard, Chicago, are architects.

**Chillicothe, Ohio** — The Mead Corporation, manufacturer of book and writing papers, bond stocks, etc., is maintaining a six-day week production schedule at local mills and expects to continue on that basis with regular working quota for an indefinite period. At its branch mill at Kingsport, Tenn., a five-day week operating schedule is being maintained, with regular working force.

**Port St. Joe, Fla.**—The St. Joe Paper Company, affiliated with the Mead Corporation, Chillicothe, Ohio, is pushing construction of new local pulp and paper mill, in course of erection for a number of months past, and proposes to have plant ready for operation in 60 to 90 days. The mill will be given over to the production of paper board products, as previously mentioned in these columns, and will have an initial rated capacity of about 350 tons of finished board per day. It will represent an investment of about $6,000,000, including townsite being established in conjunction with the mill and pulp wood property development. General erection contract has been carried out by James Stewart & Co., 230 Park avenue, New York, N. Y. George F. Hardy, 305 Broadway, New York, is consulting mill engineer. Sydney Ferguson, vice-president of Mead Corporation, is president of company.

**Bellingham, Wash.**—In connection with expansion program at mill of the Puget Sound Pulp and Timber Company, Army street, the City Council has voted bonds for $750,000 for extensions and betterments in municipal water system, to be used in part for increased water supply for the local pulp mill, including construction of a new 24-inch steel pipe line leading to plant and other operating facilities. A new water intake will be established on Lake Whatcom. Work is scheduled to be placed under way soon. As previously noted in these columns, the Puget Sound company is expending about $2,600,000 for mill enlargement and improvements.

**Fresno, Cal.**—Flax & Linen, Inc., 305 East Federal street, Baltimore, Md., is interested in a project to construct and operate a flax processing mill in the vicinity of Fresno, output to be used in part for the production of high-grade papers, and mill for this purpose will form a feature of the enterprise. Initial plant is estimated to cost over $150,000, including equipment and will be followed by other mill units in the future. It is proposed to begin work on project early in 1938.

**Three Rivers, Que.**—The St. Lawrence Paper Mills Company, Ltd., Montreal, will make improvements in mill and equipment, including overhauling of paper-making machines and other equipment at newsprint mill at Three Rivers. Work will be carried out during the period of December 24 to January 3, when mill will close down for this purpose.

### New Companies

**Chicago, Ill.**—The Republic Paper Company, 1560 North Sheffield avenue, Chicago, has been incorporated with capital of $25,000, to deal in paper products of various kinds. The incorporators include A. J. Marks, Jr., J. M. Rich and S. E. Levy.

**Boston, Mass.**—The Brewster Wallpaper Company has been chartered with capital of 900 shares of common stock, no par value, to deal in wall papers.

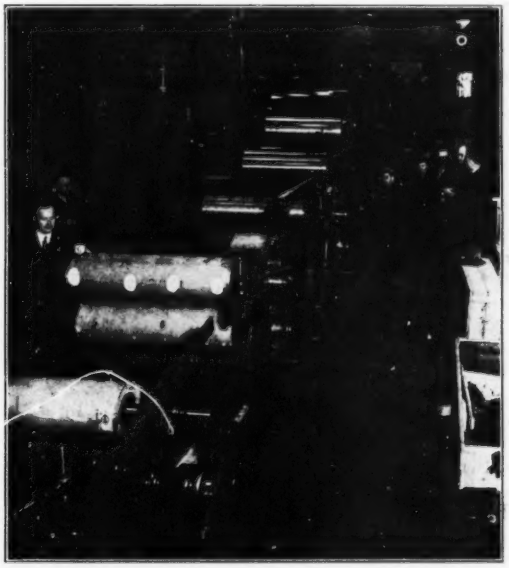
George E. Felton is president, and Charles W. Norton, treasurer.

**New York, N. Y.**—The Adams Paper and Twine Company, Inc., has been incorporated with capital of 100 shares of stock, no par value, to deal in wrapping paper and kindred paper stocks. New company is represented by B. Robbins, 25 Warren street, New York.

**Chicago, Ill.**—The National Ribbon and Carbon Paper Manufacturing Company, 75 West Van Buren street, Chicago, has been chartered with capital of $50,000, to manufacture and deal in carbon papers and other stationery and paper products. The incorporators include W. R. Emmart, G. R. Duncan and M. M. Hyde.

## Inspect Paper Machine at Syracuse

The illustration presented herewith represents the semi-commercial size paper machine installed in the new pulp and paper laboratory of the New York State



THE NEW PAPER MACHINE AT SYRACUSE

College of Forestry at Syracuse. The picture was taken during the meeting of the Empire State Section of the Technical Association of the Pulp and Paper Industry when the technical men visited the new laboratory.

## Paper and Pulp Rate Cases Decided

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., December 22, 1937.—The Interstate Commerce Commission has granted authority, on conditions, to establish and maintain rates on newsprint paper, in carloads, from Fort Frances, Ontario, Canada, and certain points in Minnesota, to destinations in central territory, without observing the long and short haul provision of Section 4 of the Interstate Commerce Act.

In another decision the Commission has also granted authority, on conditions, to establish and maintain rates on wood pulp, in carloads, from Houston, Texas, to Hamilton, Ohio, without observing the same part of the Interstate Commerce Act.

# Obituary

### Robert F. Grant

Robert Francis Grant, resident manager of the Canadian International Paper Company in Three Rivers, Que., died there on December 13, after a long illness. He was 79 years old.

Mr. Grant, described as dean of lumbermen in Eastern Canada, was president of the St. Maurice River Boom and Driving Company, Ltd., and had been a director of the North Shore Power Company and of the Grand Falls Company, New Brunswick.

He had served as an Alderman for the city of Three Rivers from 1896 to 1905 and from 1908 to 1910, and was president of the Harbor Commissioners of the Port of Three Rivers from 1922 to 1930.

Born in Three Rivers, the son of Abraham and Catherine Hickey Grant, Mr. Grant attended the English Academy there. He began his career as a shipping clerk for Ross Ritchie & Co. in Three Rivers in 1879.

He was made superintendent of the St. Maurice Lumber Company, which absorbed Ross Ritchie & Co. in 1892. In 1893, after the company became the Canadian International Paper Company, Mr. Grant was appointed to the resident managership.

He had been president of the St. Maurice Forest Protective Association, vice president of the Cooke Anti-Tubercular Hospital at Three Rivers, chairman of the Three Rivers branch of the Canadian Manufacturers Association and ex officio member of the executive council of that association, president of the Frontenac Fish and Game Club and president of the Three Rivers Athletic Association.

Surviving are his widow, sister of Prime Minister Maurice Duplessis of Quebec, and a brother, Charles.

### John Farrell

[FROM OUR REGULAR CORRESPONDENT]

PHILADELPHIA, Pa., December 20, 1937. — John Farrell, for twenty-four years employed at the Hammermill Paper Co. until his retirement about a year ago, died at his home on Friday night, following an illness of ten months.

Mr. Farrell is survived by his wife Mary, four daughters, three sons and 9 grandchildren.

Funeral services will be held from his home, 716 Cedar Street, Erie, Pa., Tuesday at 8.30 A. M. Requiem high mass will be held at St. Patrick's Church at 9 o'clock. Interment will be in Calvary Cemetery.

## Powell River Increases Newsprint

VANCOUVER, B. C., December 18, 1937.—Increase of $7.50 per ton, in this base contract rate for newsprint, has just been announced by the Powell River Sales Company, the merchandizing organization of the Powell River Company operators of the largest individual Pulp and Paper Mill on the North American continent at Powell River, B. C. The increase advances the rate to $50 per ton f.o.b. Powell River with water freight alowed to Pacific coast and gulf ports. The basic price for newsprint quoted at Vancouver, by B. C. plants, for the past six months, has been $42.50 per ton.

# PAPER TRADE JOURNAL

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## COMING EVENTS IN THE PAPER INDUSTRY

AMERICAN PAPER AND PULP ASSOCIATION, Sixty-first Annual Convention and meeting, Waldorf-Astoria Hotel, New York. February 21-25.

TECHNICAL ASSOCIATION OF THE PULP AND PAPER INDUSTRY, Convention, Waldorf-Astoria Hotel, New York, February 21-24. Annual Luncheon, Waldorf-Astoria Hotel, Wednesday, February 23.

SALESMEN'S ASSOCIATION OF THE PAPER INDUSTRY, Annual Meeting and Luncheon, Waldorf-Astoria Hotel, New York, Tuesday, February 22.

NEW YORK ASSOCIATION OF DEALERS IN PAPER MILLS' SUPPLIES. Annual Banquet, Hotel Commodore, New York, February 23.

NATIONAL PAPER TRADE ASSOCIATION OF THE UNITED STATES, Convention, Waldorf-Astoria Hotel. New York. February 21-23.

NEW ENGLAND SECTION. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Nonotuck Hotel, Holyoke, Mass.

DELAWARE VALLEY SECTION. Technical Association of the Pulp and Paper Industry—Second Friday of each month at the Engineers Club, Philadelphia, Pa.

LAKE STATES SECTION, Technical Association of the Pulp and Paper Industry— Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

KALAMAZOO VALLEY SECTION, Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park-American Hotel, Kalamazoo, Mich.

AMERICAN PULP AND PAPER MILLS SUPERINTENDENTS ASSOCIATION, Annual meeting, Royal York Hotel, Toronto, Ont., June 22-24.

## CORPORATIONS LARGE AND SMALL

The question is frequently raised that under the present conditions of our anti-trust laws and various other governmental measures, industry is tending more and more to monopolistic practices. Much comment is heard that competition is being suppressed and that the smaller enterprises are gradually being forced out of business.

This would be a menace to our democratic form of government if it were true and if we look at the record of industry itself there is apparently little cause for alarm. Rather, the factual information compiled by the Chamber of Commerce of the United States and published in the Washington Review, December 6, indicates that while the large corporations are growing larger, many of the smaller ones are also expanding and new enterprises are being started to broaden and increase competition and not stifling it.

The Chamber of Commerce states: "An Assistant Attorney General of the United States has said: 'The statistics show the disappearance of large numbers of industrial units. An era of bankruptcy has followed an era of merger and consolidation, and only a relatively small number of industrial units and sources of supply have survived. The small business man who used to be our most ardent capitalist and the most uncompromising of conservatives has been crushed, or merged, or consolidated, or otherwise retired.'

"The published records of the government itself show that in 1935 more manufacturing corporations filed returns for income tax—all enterprises in corporate form have to file such returns—than in any preceding year. In 1936 the number of manufacturing corporations filing such returns was smaller by 467, out of a total exceeding 96,000. We shall apparently have to wait until next year before learning exactly how many manufacturing corporations there were to file returns in 1937.

"The facts will bear looking at in some detail. In 1929, the number of incorporated enterprises manufacturing textiles and their products was 14,629; in 1936 the number of such enterprises filing returns was 15,658. For paper, pulp, and products, usually produced by plants of considerable size, there were 2,145 in 1929 filing returns, and 2,307 in 1936. For printing, publishing, and allied industries the number for the earlier year was 11,569, and 12,905 for the later year. For chemicals and allied products, the figures were respectively 7,505 and 7,967. In the case of companies turning out metals and metal products, there was a decrease, but even so, the number remaining was very substantial, the number in the earlier year having been 21,047, and in the later year 19,854.

"There is the same story with respect to other fields. For example, for 1929 there were 132,660 corporations to file returns as engaged in trade; in 1936 there were 149,383 corporations filing returns.

"The same representative of the Department of Justice turned to the statistics taken from income tax returns to demonstrate that 'concentration of corporate ownership of wealth, chiefly means of production, has proceeded to a surprising degree'. His statement is as follows: 'In 1932, according to the statistics of the Bureau of Internal Revenue, 53 per cent of all corporate owned assets in this country were held by 618 corporations, which constitute only .2 of 1 per cent of the number of corporations reporting.' On the point he stops there, but that is not by any means the whole story of the statistics from which he quotes. These corporations with 53 per cent of the assets shown on balance sheets submitted to the Treasury had but 37 per cent of the receipts of all corporations with balance sheets; their receipts in the year were actually equal only to 18 per cent of the assets charged up to them. Even so, almost two-thirds of this group, representing 65 per

cent of the group's assets, were in the red for the year.

"At the other end of the scale, it was the corporations with capital under $50,000 each that showed up well in the ratio of receipts to capital assets; their receipts averaged 160 per cent of their capital assets on their balance sheets. Business men who have to face balance sheets will see in such data little evidence to support the position taken on the basis of but one statistical item out of a whole table.

"The figures will stand some further scrutiny, too. The Treasury's statistics quickly disclose that of the group of large corporations 37 per cent are in the financial field, being banks, insurance companies, and the like, well known to have to utilize large capital, and these companies had 34 per cent of the assets of the group. Railroads and other large transportation enterprises constituted 34 per cent of the group, and they had 40 per cent of the assets. Yet these are the fields to which government regulation, federal and state, has long been directed."

## E. A. Oberweiser Leaves Whiting-Plover

Edward A. Oberweiser is resigning the presidency of the Whiting-Plover Paper Company, Stevens Point, Wis., and is disposing of his entire stock interests in the company to the George A. Whiting Estate. Mr. Oberweiser is not retiring from the paper business, as he has several things under consideration, but will spend the balance of this winter in Florida with his wife, who is recovering from injuries sustained in an automobile accident early last summer.

Succeeding Mr. Oberweiser as general manager will be Joseph H. Miller, who has been associated with him in the management of the company since 1910 and who now holds the office of treasurer. Further insuring continuity of the management program which has been so successful for more than a quarter of a century will be the retention of all others in the office personnel of the company.

Although Mr. Oberweiser will retire completely from all connections with the Whiting-Plover Paper Company, he will continue as one of the trustees of the trust set up under the will of George A. Whiting, former president of the company, who died July 17, 1930. The trust will continue in existence until 1940. The other trustees are Frank B. Whiting, son of the founder, who lives in Neenah, and George Hilton, Oshkosh attorney.

## G. B. Gibson Speaks on Southern Mills

A well attended meeting of the Empire State Paper Association was held at Rochester, N. Y., on December 10, 1937. George B. Gibson made a very interesting talk about the new mill developments in the South. This information was very timely and of special interest to all the members.

Finley T. Jamison, vice-president of the National Paper Trade Association was also present and helped to make the occasion a success. After the general meeting the fine and wrapping paper groups held their regular meetings as usual.

## Production Ratio Report

These statistics are based upon paper production reports to the American Paper and Pulp Association:

COMPARATIVE MONTHLY SUMMARIES

| Months | 1937 | 1936 | 1935 | 1934 |
|---|---|---|---|---|
| January | 90.3%(c) | 76.1% | 65.8% | ..... |
| February | 90.1%(c) | 77.9% | 70.0% | ..... |
| March | 90.3%(c) | 76.0% | 70.5% | ..... |
| April | 92.1%(c) | 82.3% | 70.0% | ..... |
| May | 90.6%(c) | 81.6% | 69.4% | ..... |
| June | 87.3%(c) | 80.7% | 72.3% | ..... |
| July | 81.8%(c) | 77.3% | 64.9% | ..... |
| August | 82.9%(c) | 81.5% | 70.9% | ..... |
| September | 78.6%(c) | 80.5% | 71.3% | 58.2% |
| October | 73.5%(c) | 87.6% | 75.6% | 64.7% |
| November | 61.1%(c) | 88.0% | 75.3% | 61.7% |
| December | ..... | 85.9% | 71.2% | 59.6% |
| Year Average | ..... | 81.3% | 70.5% | ..... |
| Year to Date First 49 weeks | 82.6% | 81.3% | 70.6% | ..... |

COMPARATIVE WEEKLY SUMMARIES

| CURRENT WEEKS, 1937 | | CORRESPONDING WEEKS, 1936 | |
|---|---|---|---|
| *November 6 | 64.3% | November 7 | 87.0% |
| *November 13 | 61.7% | November 14 | 87.6% |
| *November 20 | 62.0% | November 21 | 89.4% |
| *November 27 | 56.4% | November 28 | 87.9% |
| *December 4 | 59.6% | December 5 | 90.3% |
| *December 11 | 51.3% | December 12 | 93.3% |

The following statistics show the number of mills reporting by ratio groups:

| | Number of Mills Reporting, Current Weeks | | | | | |
|---|---|---|---|---|---|---|
| Ratio Limits | Nov. 6, 1937 | Nov. 13, 1937 | Nov. 20, 1937 | Nov. 27, 1937 | Dec. 4, 1937 | Dec. 11, 1937 |
| 0% to 50% | 113 | 146 | 129 | 183 | 135 | 112 |
| 51% to 100% | 205 | 173 | 186 | 121 | 164 | 99 |
| Total Mills Reporting | 318 | 319 | 315 | 304 | 299 | 211 |

* Subject to revision until all reports are received.
(c) Basic capacity data have been adjusted to correspond with ratings reported by individual companies.

PAPERBOARD OPERATING RATIOS

According to reports from the National Paperboard Association, per cents of operation, based on "Inch-Hours", were as follows:

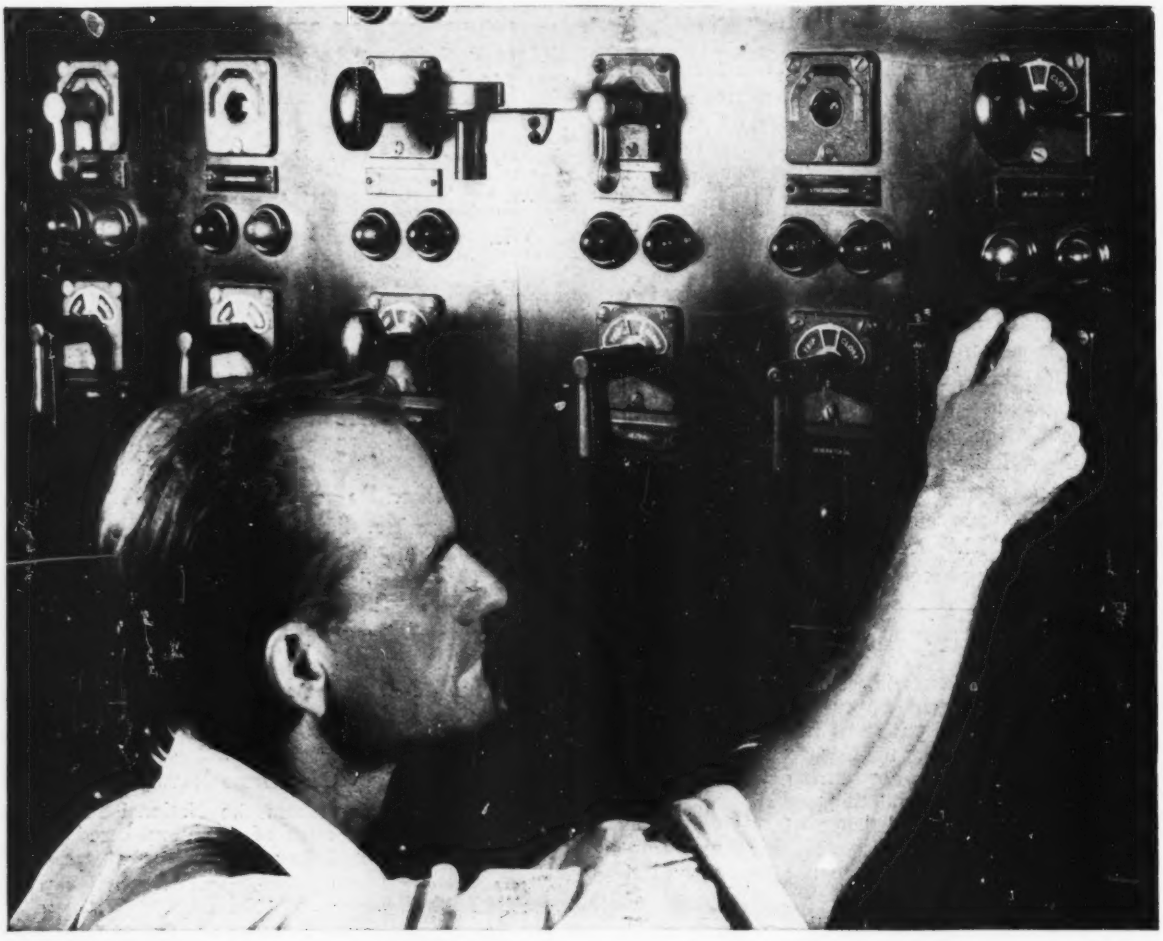
| Mos. | 1937 | 1936 | 1935 | 1934 | Mos. | 1937 | 1936 | 1935 | 1934 |
|---|---|---|---|---|---|---|---|---|---|
| Jan. | 80%(e) | 61% | 61% | .... | July | 67%(e) | 69% | 59% | .... |
| Feb. | 86%(e) | 67% | 67% | .... | Aug. | 74%(e) | 75% | 65% | .... |
| Mar. | 87%(e) | 68% | 67% | .... | Sept. | 70%(e) | 76% | 69% | 62% |
| Apr. | 89%(e) | 70% | 61% | .... | Oct. | 66%(e) | 82% | 76% | 63% |
| May | 86%(e) | 68% | 61% | .... | Nov. | 56%(e) | 79% | 70% | 56% |
| June | 75%(e) | 68% | 65% | .... | Dec. | .... | 74% | 60% | 52% |

Week end. Nov. 6, 1937—56%
Week end. Nov. 13, 1937—57%
Week end. Nov. 20, 1937—56%
Week end. Nov. 27, 1937—50%
Week end. Dec. 4, 1937—50%
Week end. Dec. 11, 1937—53%

(e) Basic figures revised to include new members of the National Paperboard Assn.

## Testimonial Dinner for W. H. Cole

DEFERIET, N. Y., December 13.— William H. Cole, superintendent of the local branch of the St. Regis Paper Company, was the guest of honor at a testimonial banquet this week at the St. Regis Inn following announcement of his retirement after completing 30 years of service at the mill. He is 63 years old. Over 100 persons attended the affair which was staged under the direction of the local branch of the International Brotherhood of Papermakers. Following the dinner, Earl Soper, president of the union local, called on several of the old members for brief speeches and Mr. Cole was the recipient of a gold watch with his name and the name of the local organization engraved on it. Mr. Cole first started working in a paper mill when he was 17 years old and he has had 46 years of experience at nearly every kind of mill work. In 1901 he came to this village to take the position as machine tender at the local mill and he won promotion a few years later. He plans to leave next month for Florida.



# The More Power to Him!

A CHANCE visitor might attribute C. J. Dorst's passion for keeping everything "just so" to temperament or to plain fussiness. But as power plant operator at Mathieson's Lake Charles plant, Dorst's job carries responsibilities which call for precisely this sort of thoroughness.

For not only must power service throughout Mathieson's plant be continuous. Its output must be closely controlled; voltage and frequency must be kept within narrow limits; generators must be accurately synchronized. Only in this way can Mathieson take full advantage of the low-cost raw materials and fuel at Lake Charles, and translate these into outstanding quality for its products.

Mathieson's generating equipment at Lake Charles comes as close to perfection as the rest of the units in this modern alkali plant. Yet all this equipment would mean little to you were it not for the supervision of men like C. J. Dorst. In large measure, it is these men—faithfully handling hundreds of "big little" jobs—who make Mathieson an organization to which you can look with unwavering confidence.

*The* MATHIESON ALKALI WORKS (*Inc.*)
60 East 42nd Street New York, N. Y.

*Soda Ash . . . Caustic Soda . . . Bicarbonate of Soda . . . Liquid Chlorine Bleaching Powder . . . HTH and HTH-15 . . . Ammonia, Anhydrous and Aqua PH-Plus (Fused Alkali) . . . Sulphur Chloride . . . CCH (Industrial Hypochlorite) Dry Ice (Carbon Dioxide Ice)*

Mathieson Chemicals

Section of the
Technical Association of the Pulp and Paper Industry

Edited by Ronald G. Macdonald, Secretary

# Lake States Discuss Paper Machines

The December meeting of the Lake States Section of The Technical Association of the Pulp and Paper Industry, was held at the Conway Hotel, December 14 at 6:30 P.M. Following dinner which was attended by approximately 90 members, an illustrated talk on "New Development in Paper Machine Manufacture" was presented by J. E. Goodwillie and T. C. Roberts of the Beloit Iron Works, Beloit, Wis. The success of various installations of the dual horizontal press section was discussed and figures presented which showed how these installations materially increased machine production. Moving pictures showing the structural details of the horizontal press and its operation in several mills were shown. It was pointed out that this press section has proved equally successful on fourdrinier machines making all types of papers.

### Other Developments Discussed

Other recent developments in machine design which were discussed included insulated drier journals and bearings and the use of breaker stacks in a split drier section to obtain better finish and formation in the sheet. By insulating the steam inlet to the drier drums as the line passes through the rear journal and bearing, it is claimed that less bearing friction results and consequently longer bearing life. This insulated bearing and journal as well as the use of breaker stacks on the fourdrinier machine are all recent developments and as yet are still in the experimental stage. The theory of the breaker stack is to apply a calendering action to the paper before it is too dry, but only after it is sufficiently dry to withstand such an action. The breaker stack is placed in the drier section after anywhere from 50 to 80 per cent of the drying capacity has been passed over. The latter figure varies, depending on the type of sheet being made.

### Those in Attendance

Those present included: L. O. Johnson, Kimberly Clark Corporation, Neenah, Wis.; R. H. Kehl, same company; H. J. Adrian, Consolidated Water Power and Paper Company, Stevens Point, Wis.; H. B. Richmond, same company, located at Wisconsin Rapids, Wis.; J. E. Goodwillie and T. C. Roberts, Beloit Iron Works, Beloit, Wis.; C. W. Champley, Escanaba Paper Company, Escanaba, Mich.; C. R Morse, Wisconsin River Paper and Pulp Company, Stevens Point, Wis.; H. W. Morgan, Institute of Paper Chemistry, Appleton, Wis.; Bob Driessen, Thilmany Pulp and Paper Company, Kaukauna, Wis.; George Vandenack, Hoberg Paper Mills, Green Bay, Wis.; Joseph Marchont, same company; John Francort and Francis Allard of the same company; C. M. Ketzinger, J. J. Plank & Co., Appleton; W. J. Fahrenkrug, Badger Paper Mills, Peshtigo, Wis.; M. J. Auchter, Hoberg Paper Mills, Green Bay; L. M. Doty, Escanaba Paper Mills, Escanaba; E. H. Voigtman, Kimberly-Clark Corporation, Neenah; W. C. Christensen, Hoberg Paper Mills, Green Bay; R. E. Kissel, K. F. Horan, L. J. DeBauche Jr., and W. B. Giese, of the same company; V. H. Woehler, Fox River Paper Company, Appleton; J. E. Watson, Wisconsin Wire Works, Appleton; J. P. Ruth, Chemical and Pigment Company, Collinsville, Ill.; Paul Boronow, Valley Iron Works, Appleton; A. S. Cline, Chemical and Pigment Company, Collinsville; W. O. Johnson, Hoberg Paper Mills, Green Bay; R. W. Haddock, Escanaba Paper Company, Escanaba; Frank Doubleday, Wadhams Oil Company, Appleton; Don Beisel, same company; S. I. Anderson, Hooker Electrochemical Company, New York; W. H. Burns, Valley Iron Works, Appleton; R. E. Minahan, Hoberg Paper Mills, Green Bay; J. H. Graff, Institute of Paper Chemistry, Appleton; W. M. McGraw, General Electric Company, Milwaukee, Wis.; Howard Sheldon, Hoberg Paper Company, Green Bay; L. W. Jakel, Kimberly-Clark Corporation, Neenah; M. C. Heyer, Hasco Valve Machinery Company, Milwaukee; P. H. West, Thilmany Pulp and Paper Company, Kaukauna; Herbert Wenberg, Nicolet Paper Corporation, De Pere, Wis.; R. F. Bernard, Kimberly-Clark Corporation, Neenah; M. L. Downs, Thilmany Pulp and Paper Company, Kaukauna; Rex Bradt Fox River Paper Company, Appleton; I. R. Valentine Jr., Fox River Paper Company, Appleton; R. Brenzel, Thilmany Pulp and Paper Company, Kaukauna; Stephen Kukolich, Neenah Paper Company, Neenah; W. J. Plank, J. J. Plank & Company, Appleton; N. L. Malcove, Northern Paper Mills, Green Bay; J. W. Anderson, Nekoosa Edwards Paper Company, Port Edwards, Wis.; L. A. Gilbertson, Marathon Paper Mills Company, Menasha, Wis.; J. C. Wollwage, Institute of Paper Chemistry, Appleton; L. S. Sabatke, same; E. B. Beede, Foxboro Company, Chicago, Ill.; J. G. Callan Jr., same company, Foxboro, Mass.; R. G. Knechtges, Northern Paper Mills, Green Bay, Wis.; Sigge Ekman, Rhinelander Paper Company, Rhinelander, Wis.; F. H. Johnson Jr., Chemipulp Process, Watertown, N. Y.; W. H. Swanson, Kimberly-Clark Corporation, Neenah, Wis.; M. J. Ketter, Hoberg Paper Mills, Green Bay, Wis.; M. A. Buchanan, Institute of Paper Chemistry, Appleton; Charles Johnson, same company; J. A. Van den Akker, same company; and O. F. Jilek, Valley Iron Works, Appleton.

# New England TAPPI Discusses Drying

The New England Section of the Technical Association of the Pulp and Paper Industry met at the Hotel Holyoke, Holyoke, Mass., Friday evening, December 17, 1937. John B. Calkin presided as Chairman.

### Election of Officers

All of the present officers were elected for the coming year. These include: Chairman, John B. Calkin, Dennison Manufacturing Company, Framingham, Mass.; Vice Chairman, L. K. Burnett, Gair Thames Containers, New London, Conn.; Secretary, Helen U. Kiely, American Writing Paper Company, Holyoke, Mass.; Treasurer, W. O. Johnson, Westfield, Mass.; Executive Committee—H. T. Barker, Bird and Son, E. Walpole, Mass.; F. W. Schneider, Hampden Color and Chemical Company, Springfield, Mass.; F. C. Clark, Pond's Extract Company, Seymour, Conn.; Roger C. Griffin, Arthur D. Little, Cambridge, Mass.; and J. P. Kennedy, American Writing Paper Company, Holyoke, Mass.

### Pulp Drying

The speaker of the evening was Prof. T. K. Sherwood of the Massachusetts Institute of Technology who talked on "Water Removal From Pulp and Paper." This paper will be published soon in the Paper Trade Journal.

### Movies on Heat

The sound motion picture "Heat and Its Control" of the Johns-Manville Company was shown.

Those present were:

George W. Munson, Fitchburg Paper Company, Fitchburg, Mass.; J. J. Hankard, Wheelwright Corporation, Leominster, Mass.; John B. Calkin, Dennison Manufacturing Company, Framingham, Mass.; Harold J. Pugsley, Dennison Manufacturing Company, Framingham, Mass.; Roger C. Griffin, Arthur D. Little, Inc., Cambridge, Mass.; R. J. Proctor, Fitchburg Paper Company, Fitchburg, Mass.; Robert Mannheim, Mathieson Alkali Company, Providence, R. I.; A. M. Altieri, Fitchburg Paper Company, Fitchburg, Mass.; C. W. Damon, Fitchburg Paper Company, Fitchburg, Mass.; G. E. Mangsen, Fitchburg Paper Company, Fitchburg, Mass.; W. P. Morris, Parsons Paper Company, Holyoke, Mass.; E. C. Jacobi, A. E. Broughton & Co., Glens Falls, N. Y.; A. G. Vaeth, Robert Gair Company, New London, Conn.; W. A. Nivling, Huron Milling Company, Boston, Mass.; Miss Mildred Smith, A. E. Broughton & Co., Glens Falls, N. Y.; N. I. Bearse, Champion International Company, Lawrence, Mass.; J. D. Dickson, Jr., R. T. Vanderbilt Company, New York City; T. A. DeMarco, Johns-Manville Sales Corporation, Springfield, Mass.

R. G. Macdonald, TAPPI, New York City; John B. Calkin, Dennison Manufacturing Company, Framingham, Mass.; W. P. Richardson, Arthur D. Little, Inc., Cambridge, Mass.; W. O. Johnson, Westfield, Mass.; D. C. Crosby, Johns-Manville Sales Corporation, Boston, Mass.; W. F. Drake, Dennison Manufacturing Company, Framingham, Mass.; C. J. Lindquist, Bird Machine Company, South Walpole, Mass.; A. M. King, Dennison Manufacturing Company, Framingham, Mass.; R. W. Smith, Bird Machine Company, South Walpole, Mass.; E. G. Parker, Dennison Manufacturing Company, Framingham, Mass.; S. W. Blanchard, Wheelwright Paper Company, Leominster, Mass.; Ben Mayo, Imperial Color Works, New York City; F. H. Osborne, C. H. Dexter & Sons, Windsor Locks, Conn.

H. P. Smith, C. H. Dexter & Sons, Windsor Locks, Conn.; J. P. Scobie, Mason-Neilan Regulator Company, Boston, Mass.; E. White, Wheelwright Paper Company, Leominster, Mass.; Frank R. Filz, Wheelwright Paper Company, Leominster, Mass.; J. M. Booth, Huron Milling Company, New York City; P. S. Bolton, Clinton Company, Boston, Mass.; R. H. Doughty, Fitchburg Paper Company, Fitchburg, Mass.; L. A. Thompson, Hercules Powder Company, Holyoke, Mass.; A. C. Lamoureux, Dennison Manufacturing Company, Framingham, Mass.; R. E. Kilty, A. E. Staley Manufacturing Company, Springfield, Mass.

J. J. Burke, Bird & Son, Inc., E. Walpole, Mass.; Cornelius Stapley, Chemical Paper Company, Holyoke, Mass.; H. T. Barker, Bird & Son, Inc., E. Walpole, Mass.; Fred Gibbs, Boston, Mass.; E. F. Rothman, Wallace & Tiernan, Inc., Bridgeport, Conn.; Vernon Woodside, Mathieson Alkali Works, New York City; C. A. Homan, Bird & Son, E. Walpole, Mass.; Chas. P. Kirchan, General Electric Company, Pittsfield, Mass.; Paul Knight, Bird & Son, E. Walpole, Mass.; P. W. McPherson and O. W. Messner, Robertson Paper Box Co., Montville, Conn.; Miss Marion Lunn, Holyoke, Mass.; L. N. Smith, American Tissue Mills, South Hadley, Mass.

Helen U. Kiely and Lena E. Kelley, American Writing Paper Corp., Holyoke, Mass.; Robert Loomis, Case Bros., Manchester, Conn.; James Fitzgerald and Charles Backus, Collins Manufacturing Co., N. Wilbraham, Mass.; James Merrill, Sr., Valley Paper Company, Holyoke, Mass.; James Merrill, Jr., Holyoke, Mass.; E. C. Reid and L. M. Yoerg, American Writing Paper Corp., Holyoke, Mass.; William Anderson, Stevens Paper Company, Westfield, Mass.; Kurt Wandell, Philadelphia, Pa.; Fred Schneider, Hampden Color and Chemical Company, Springfield, Mass.; F. C. Clark and E. C. Bowman, The Pond Company, Seymour, Conn.; John T. Leecock, John P. Kennedy and M. V. Horgan, American Writing Paper Corp., Holyoke, Mass.; A. L. Perry, Krebs Pigment Company, Boston, Mass.; A. P. Jackson, American Writing Paper Corporation, Holyoke, Mass.

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## Discuss Pulp Rates at Cincinnati

CINCINNATI, Ohio, December 8, 1937—Proposals to make rates from Southern wood pulp mills to Miami Valley paper mills comparable to rates on wood pulp imported from Canadian and Scandinavian sources were discussed last week at the public session of the Joint Contact Committee of the railroads, meeting at the Hotel Netherland Plaza.

Traffic managers of several paper mills in the Lockland area and cities of the Miami Valley made statements.

Southern mills are asking for rate reductions to enable them to supply Ohio paper mills with pulp made from slash pine and other Southern woods.

# Instrumentation Studies. XXVI*

## Penetration of Papers By Liquids and Solutions†

### Part II. The Barss, Knobel, and Young News Penetration Tester

By The Staff of The Institute of Paper Chemistry

The purpose of the News Penetration Tester is described by the manufacturers as follows:

"The News Penetration Tester has been designed to fill the need of an instrument which will determine accurately the penetration properties or the sizing of paper using the inks which are actually used in printing or writing"[1].

"The News Penetration Tester is a simple, objective method of measuring quantitatively the penetration of any medium into paper"[1].

"This instrument extends the value of present methods of measuring size: first, by employing as the penetrating medium the same type of ink that is used in printing and writing; again, by fixing precisely the end point of the test, converting a measurement which is now scarcely better than qualitative into one which has quantitative significance; and finally, by enabling independent measurement to be made of the surface and beater size of a sheet"[2].

In discussing the effect of the opacity of the paper on the use of the instrument, it is stated that—

"The instrument is calibrated before each test with the sample placed over an essentially optical black. This eliminates the total opacity of the paper from the measurement, and hence, permits sizing comparison to be drawn between papers of different opacity. This preliminary calibration also eliminates the optical characteristics of the surface of the sheet such as brightness, color, and surface irregularities"[2].

It is the purpose of this report to present the results of observations made with the instrument to determine the extent to which it fulfills these claims and to present the results of theoretical considerations of the fundamental nature of the instrument.

The data presented here were obtained with a single instrument, Serial No. 23, but it is believed that the results are typical of all instruments of that model. All the papers on which observations were made were carefully sampled and were conditioned for at least twenty-four hours in a constant temperature and humidity room at a temperature of 70 deg. F. and at a relative humidity of 65 per cent. The instrument was used in the same constant temperature room.

* Studies XXII-XXV will appear in later issues of The Paper Trade Journal.

† Part I of this series will be a theoretical discussion of the penetration of papers by liquids and solutions, which it is hoped will be published at an early date. Part II is presented at this time because of the interest in this particular instrument.

[1] The News Penetration Tester—a descriptive pamphlet issued by Barss, Knobel, and Young.

[2] Hammond, J., Paper Trade J. 103, no. 21:37-39 (Nov. 19, 1936).

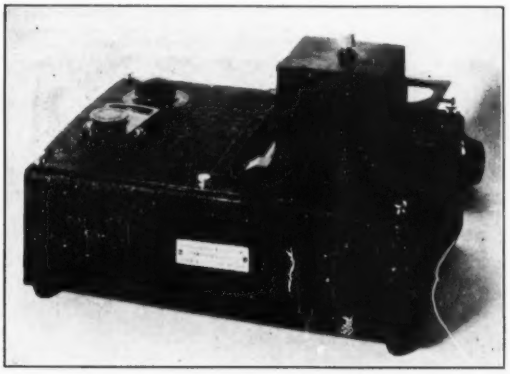

FIG. 1.
**Barss, Knobel, and Young News Penetration Tester.**

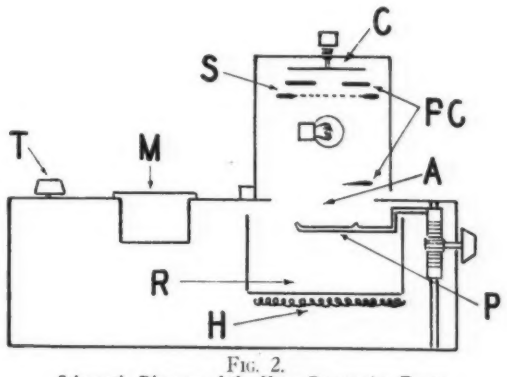


FIG. 2.
**Schematic Diagram of the News Penetration Tester.**

## SECTION I

### Description of the Instrument and its Operation

A photograph of the News Penetration Tester is given in Fig. 1, and a diagrammatic sketch is shown in Fig. 2. This sketch was copied from one in the manufacturer's pamphlet. Light from the lamp passes downward through the hole in the lower annular photocell, *PC*, and strikes the sample surface which is placed over the aperture *A*. A part of the reflected light is received by the lower photocell. Light from the lamp also passes upward through the hole in the upper annular photocell, *PC*, and strikes the "calibrating" surface, *C*. A part of the light reflected by this surface is received by the upper photocell. The distance between the calibrating surface and the upper photocell surface is variable. The variation of this distance changes the intensity of the light incident on the photocell, and therefore changes the photocurrent. The circuit is "balanced" in the sense that the photocells and galvanometer are so connected that the galvanometer, *M*, measures the difference between the two photocell currents. Adjustment of the calibrating surface until the galvanometer shows no deflection balances the photocurrents. Two blackened wire screens are provided (they are called the 30 per cent and 80 per cent screens), which

transmit 33 per cent and 80 per cent, respectively, of the light incident upon them in a parallel beam. The placement of one of these screens, *S*, in the instrument between the lamp and the upper photocell reduces the light reaching that photocell by a definite fraction of the initial amount. The photocurrents are thus no longer balanced and the galvanometer deflects. The ink pot, *P*, may be raised to bring the liquid surface into contact with the surface of the sample. As the test liquid penetrates the sample, the amount of light reaching the lower photocell decreases, since the reflectance of the sheet decreases with increasing penetration. As penetration proceeds, the intensity of the reflected light received by the lower photocell reaches a value for which the lower photocell current again balances the current of the upper photocell and the galvanometer again shows no deflection.

The instrument includes a heating coil, *H*, for control of the temperature of the ink reservoir, *R*. The lamp bulb is a standard 6 to 8 volt automobile lamp. The instrument operates directly from the usual 110-115 volt 60 cycle a. c. mains.

The procedure for use of the instrument is the following: The reservoir is filled with the test liquid and the instrument is turned on. The temperature of the ink reservoir is maintained at a constant value by means of the heater, or the instrument is used in a constant temperature room. Ten to fifteen minutes are allowed for attainment of equilibrium temperature conditions. With the ink pot at its lowest position, the sample is placed over the sample aperture, and, with the screen removed from the optical path, the calibrating surface is adjusted until the galvanometer shows no deflection. The desired screen is slipped into place, reducing the intensity of the light incident on the upper photocell surface to a definite fraction, say 80 per cent, of its initial value. The circuit is unbalanced and the galvanometer deflects. The ink pot is raised and the stop watch is started as the liquid surface touches the sample. When the penetration of the liquid has reduced the reflectance of the sheet to 80 per cent of its initial value the photocurrents are again balanced and the galvanometer shows no deflection. At that instant the watch is stopped. The time thus measured is taken as a measure of the rate of penetration of the test liquid through the sample.

## SECTION II

### Measurement of Sizing with the Instrument

The effectiveness of the instrument in the measurement of sizing was studied by obtaining instrument readings for thirteen paper samples covering a considerable range of sizing characteristics. The recommended water-soluble dye solution[3] was used as the test liquid and in all cases penetration proceeded from the felt side of the sample. TAPPI size tests were made on the same samples. Table I lists the instrument readings and the corresponding times for the TAPPI tests. Each listed instrument reading in this report is the average of the observed times for five test sheets of the sample.

[3] The recommended water-soluble dye solution is described as follows in the instruction sheet accompanying the instrument:
"Water soluble ink for determination of feather: Dissolve 6 grams of National Soluble 2 B Extra (National Aniline and Chemical Co.) in 250 cc. of distilled water at temperature 120° F., add 6 cc. of Concentrated Hydrochloric Acid, cool to 70° F., and add sufficient distilled water to make total volume 950 cc. Store in dark glass bottle."

TABLE I

| Sample | Instrument readings 80% screen (sec.) | TAPPI time (sec.) |
|---|---|---|
| 1 Mimeo | 2.6 | 15.2 |
| 2 News print | 43.3 | 36.3 |
| 3 All rag | 43.9 | 40.1 |
| 4 All rag | 53.1 | 40.5 |
| 5 All rag | 54.5 | 41.9 |
| 6 All rag | 105.7 | 42.5 |
| 7 All rag | 66.6 | 44.4 |
| 8 All rag | 142.6 | 44.7 |
| 9 Coated book | 150.2 | 46.7 |
| 10 All rag | 59.7 | 47.6 |
| 11 Mimeo | 439 | 49.7 |
| 12 Kraft | 964 | 68.6 |
| 13 Butcher's wrap | 1873* | 83.7 |

* This reading was a single one, not the average of five individual readings.

Table II lists the individual readings taken on two samples for the purpose of illustrating the precision with which instrument readings can be made. The values listed are typical, being neither the least nor the most concordant.

TABLE II

| Instrument readings | |
|---|---|
| Sample 3 (sec.) | Sample 12 (sec.) |
| 44.2 | 761.7 |
| 47.7 | 1165.0 |
| 47.2 | 1082.6 |
| 40.8 | 983.6 |
| 39.5 | 826.0 |

Fig. 3 shows graphically the relation between the instrument readings and the TAPPI size times listed in Table I. Fig. 4 shows part of the same data plotted on an enlarged scale. It appears at first glance that the instrument is much more sensitive to variations in sizing than is the TAPPI test. This appearance of great sensitivity is purely illusory, however. The appearance of the sheets at the end point differed markedly for the different samples. In some cases the upper surface of the sheet was badly wrinkled and warped and appeared thoroughly soaked with water, while in other cases the upper surface of the sheet appeared dry but showed transparent spots, through which the dye could be seen. The samples exhibiting these behaviors were erratically distributed as to magnitude of the observed instrument readings. In general, the dye was adsorbed at the surface of the sheet. If a sheet was blotted and torn, after completion of a test, inspection of the tear usually showed that the dye had penetrated only to the depth of the surface fibers. Samples 1, 2, and 12 were completely penetrated by the dye in a number of small spots.[4] Between these spots, however, the dye was adsorbed at the surface of the sheet.

The completeness of the dye adsorption was demonstrated most clearly in the case of a measurement

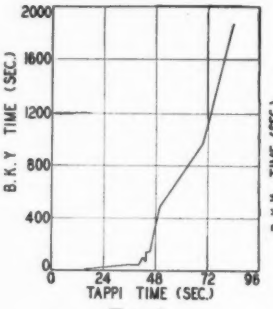


FIG. 3.

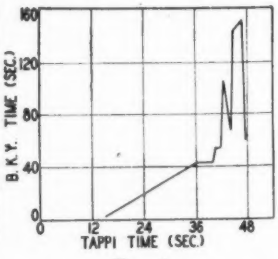


FIG. 4.

FIG. 3. Correlation Between Instrument Readings and TAPPI Size Tests. FIG. 4. Portion of FIG. 3 on Enlarged Scale.

made on a coated book paper (sample 9) with the 30 per cent screen. In that test dew-like drops of clear water appeared on the upper surface of the sheet *before* the end point was reached. In no case was the dye observed to penetrate the sheet uniformly to a significant depth.

The meaning of the end point is thus seen to be obscure. If the dye did not separate, but remained in solution as the liquid passed into the sheet, the time required to reach an end point would be a measure of the rate of penetration of the liquid into the sheet. When the dye is adsorbed at the surface, however, the decrease in reflectance of the sheet during the test is due only in part to a decrease in the thickness of the reflecting layer of paper. The major part of the reflectance change is due to the decreased opacity of the water-soaked layer of the sheet, which transmits an increased fraction of the incident light to the lower surface where the dye is adsorbed. The effectiveness of the water in increasing the translucency of the sheet depends on the formation of the sheet, and on the effective refractive index of the furnish. The instrumental ordering of samples of different formation and density must depend, therefore, not only on the degree of sizing of the sheets, but in a complicated fashion on the manner in which the dye is adsorbed, on the nature of the furnish, and on the volume and distribution of the voids in the sheet.

The finding of an apparently high sensitivity for a test of this nature is not unusual. Carson[5] found a similar situation in his consideration of size tests.

In Table I the samples were arranged and numbered in the order of increasing TAPPI size time. The observed instrument readings were assigned consecutive numbers, starting with 1, in the order of increasing magnitude of reading. That ranking of the samples by the News Penetration Tester was plotted as a function of the ranking by the TAPPI test, i.e., as a function of the sample number. Fig. 5 shows the correlation of the two methods of ranking the samples.

Only three measurements of water penetration were made with the 30 per cent screen. The considerations of the penetration process given above applied to the use of either screen, and the behavior of

[4] It is important to note the area such spots must have in order to exert an appreciable effect on the instrument reading. If the spots were completely absorbing and if the sample were uniformly illuminated, the spots would need to cover one per cent of the illuminated area of the sample in order to change the reflectance by one per cent. The change in the instrument reading for a one per cent change in the reflectance of the sample depends on the rate of penetration. For a quickly penetrated sample, the change in the instrument reading would be less than one per cent, while for a sample which is penetrated slowly, the instrument reading might change by as much as 10 per cent.

[5] Carson, F. T., Measurement of the Degree of Sizing of Paper. National Bureau of Standards, Technologic Paper, No. 326, 1926. 30 p.

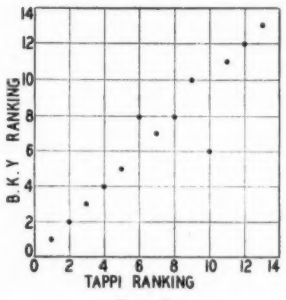


FIG. 5.

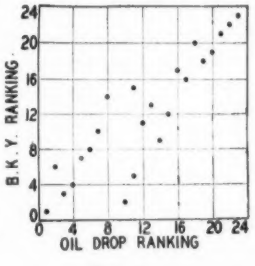


FIG. 6.

FIG. 5. Ranking of Papers by the Instrument Readings vs. Ranking by TAPPI Size Test. FIG. 6. Ranking of Papers by the Instrument with the 80 Per Cent Screen vs. Ranking by the Oil Drop Test.

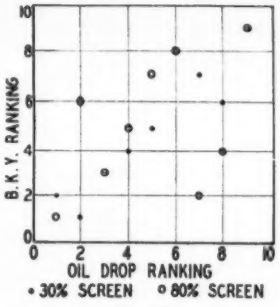


FIG. 7.

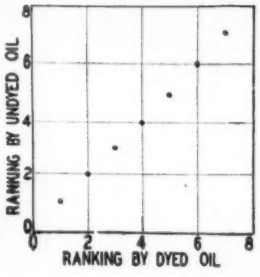


FIG. 8.

FIG. 7. Ranking of Papers by the Instrument with the 30 Per Cent and 80 Per Cent Screens vs. Ranking by the Oil Drop Test. FIG. 8. Instrument Ranking for Undyed Oil vs. Instrument Ranking for Dyed Oil.

the instrument for the coated book paper already mentioned, for which drops of water appeared on the upper surface of the paper before the end point was reached, promised no advantage to ensue when the 30 per cent screen was used. The observed times for the three samples tested with the 80 per cent and the 30 per cent screens, respectively, were: sample 1, 2.6 and 7.7 sec.; sample 2, 43.3 and 193.7 sec.; sample 9, 150.2 and 2822 sec.

## SECTION III

### Measurement of Rate of Oil Penetration

The rate of penetration of the recommended oil solution[6] through twenty-three printing papers was measured with the instrument and the 80 per cent screen. Readings with the 30 per cent screen were obtained with nine of the same group of samples. The rates of penetration were also measured by the conventional oil drop method, using the Fuess apparatus with castor oil. Table III lists the values obtained.

The relative ranking of these samples by the News Penetration Tester with the 80 per cent screen and dyed oil solution and by the oil drop test is shown in Fig. 6. Fig. 7 shows the relative ranking of the nine samples for which observations were made with the 80 and 30 per cent screens. The solid circles of Fig. 7 give the ranking by the 80 per cent screen, while the open circles give the ranking by the 30 per cent screen. The correlation between the instrument readings and the times for the oil drop test are seen to be definitely better when the 30 per cent screen is used than when the 80 per cent screen is used.

*Role of the Dye in the Test Liquid:*

Many of the samples examined during the tests of oil penetration showed strong adsorption of the dye at the surface of the sheet. As already mentioned in the discussion of water penetration, it seemed most likely that the observed change in reflectance was due to the decrease in the opacity as the oil penetrated the sheet. Observations on seven samples showing pronounced adsorption were made with undyed castor oil to test that supposition. Table III, column 3, lists the observed instrument readings for the 80 per cent screen. The bottom of the ink pot is painted black to provide a black background. Fig. 8 shows the relative ranking of the samples when the instrument was used with dyed oil and with undyed oil.

[6] The recommended oil-soluble ink is described as follows in the instruction sheet which accompanied the instrument:

"Oil soluble ink for routine oil penetration tests: Dissolve 5% by weight of Nigrosine Base R. Concentrated in castor oil at temperature of 120°—140° F."

TABLE III

| Sample | Instrument readings in sec. Dyed oil 80% screen | Undyed oil 80% screen | Dyed oil 30% screen | Oil drop (sec.) |
|---|---|---|---|---|
| 3 | 54.3 | 48.1 | .. | .. |
| 4 | 35.4 | 42.5 | .. | .. |
| 5 | 229.4 | 198.2 | .. | .. |
| 6 | 1398 | 929 | .. | .. |
| 7 | 759 | 555 | .. | .. |
| 8 | 910 | 835 | .. | .. |
| 10 | 451 | 450 | .. | .. |
| 14 | 75.4 | .. | .. | 258 |
| 15 | 601 | .. | .. | 1440 |
| 16 | 211 | .. | .. | 750 |
| 17 | 91.8 | .. | .. | 396 |
| 18 | 29.6 | .. | .. | 111 |
| 19 | 17.6 | .. | 169.3 | 156 |
| 20 | 32.1 | .. | .. | 116 |
| 21 | 9.18 | .. | 79.3 | 122 |
| 22 | 135 | .. | .. | 246 |
| 23 | 74.8 | .. | .. | 191 |
| 24 | 28.8 | .. | .. | 178 |
| 25 | 11.4 | .. | 33.3 | 47 |
| 26 | 10.1 | .. | 40.2 | 75.4 |
| 27 | 19.7 | .. | .. | 108 |
| 28 | 20.5 | .. | .. | 127 |
| 29 | 14.1 | .. | 54.9 | 91.4 |
| 30 | 47.6 | .. | .. | 209 |
| 31 | 3.70 | .. | 37.7 | 44.5 |
| 32 | 14.7 | .. | 114.8 | 100 |
| 33 | 338 | .. | .. | 960 |
| 34 | 10.1 | .. | 70.5 | 126 |
| 35 | 10.1 | .. | 46.6 | 88 |
| 36 | 29.2 | .. | .. | 147 |

Additional information on the effect of oil permeation of the sheet on its reflectance and opacity was obtained by measuring the transmittance of several sheets before and after they were thoroughly permeated with the castor oil. The reflectances of the single sheets backed by a black surface were also measured before and after oil permeation. The total transmittances were measured on the I.P.C. Transparency Meter. The reflectances were measured on the General Electric Reflection Meter with the No. 4 filter. Table IV presents the results of the measurements.

TABLE IV

| | Sample 1 mimeo | Sample 2 news print | Sample 9 coated book |
|---|---|---|---|
| Total transmittance of the original sheet, in %..... | 14.8 | 15.0 | 9.3 |
| Total transmittance after permeation with oil, in %..... | 58.2 | 63.5 | 46.0 |
| Reflectance of single sheet before permeation, in %..... | 72.5 | 59.7 | 75.8 |
| Reflectance of single sheet after permeation, in %..... | 22.2 | 11.9 | 27.6 |

Thus it appears that for some samples the dye plays an unimportant part in the observed change in reflectance. In other cases, in which the dye was observed to pass through at least parts of the sheet, the dye must play a part. The relationship between the change in reflectance and the depth of penetration, when the change in reflectance is due to change in opacity of the sheet, must be different from that which obtains when the change is due to an effective decrease in the thickness of the sheet as the dye penetrates and blocks out the layer penetrated. It seems clear, then, that the instrument reading depends upon sheet properties which do not necessarily govern the rate at which an oil will penetrate the sheet. Again, two of these factors would be formation and effective index of refraction of the furnish. Effective index of refraction is obviously not related to oil permeability, but it is functionally related to the instrument reading.

## SECTION IV

### Dependence of the Instrument Readings on Color

The fact that the instrument readings must depend on color may be shown by the following argument. For simplicity, consider the idealized situation in which it is assumed that the penetrating liquid is perfectly black, that no adsorption of coloring matter occurs, and that the liquid penetrates uniformly, so that the impregnated layer of the sample is separated from the virgin layer by a plane boundary. Suppose the instrument to have a monochromatic light source, e.g., one which radiates only blue light of wave lengths between 450 and 451 millimicrons. Consider the readings to be found when a red and a blue sample, identical in every respect except color, are tested in the instrument with the 80 per cent screen. The reading for the blue sheet will be a time, $t_b$, corresponding to the fraction, $f_b$, of the thickness of the sheet which it was necessary for the liquid to penetrate in order to decrease the reflectance to 80 per cent of its initial value. Similarly, the reading for the red sheet will be a time, $t_r$, corresponding to the fraction, $f_r$. The values $t_r$ and $f_r$ will be greater than the values $t_b$ and $f_b$, because the liquid must penetrate a greater depth of the red sheet than of the blue sheet in order to change their reflectances by the same fraction of their initial values on account of the greater opacity of the red sheet to blue light. Similarly, if the instrument is supposed to have a monochromatic light source which radiates only red light, having wave lengths between 650 and 651 millimicrons, the corresponding values $T_b$ and $F_b$ will be greater than the values $T_r$ and $F_r$, because the liquid will now have to penetrate a greater depth of the blue sheet in order to reduce the reflectances to the same fraction of their initial values on account of the greater opacity of the blue sheet to red light.

In the actual instrument, then, the observed times and the associated depths of penetration must be a complicated function of the spectral reflectance of the samples and of the relative spectral energy distribution of the light source.

The dependence of the opacity of a sheet of paper on the color of the illuminant is illustrated in Fig. 9, which shows, for a red and for a blue sample, the ratio of the reflectance of a single sheet backed by a black surface to the reflectance of a single sheet backed by a block of magnesium carbonate as a function of the wave length of the incident light. The curves were obtained with the new model of the General Electric Recording Spectrophotometer.

The reader may visually demonstrate to himself the nature of this dependence of opacity on the color of the illuminant by using the samples of paper and of cellophane which were supplied with the report distributed by the American Paper and Pulp Association[7]. The red and blue sheets of paper are from the same samples as were those used to obtain the curves of Fig. 9. Lay the two sheets of paper side by side on a uniformly printed page and view them. The printing can be discerned through either of the two sheets. Leaving the papers as they are, view them alternately through the red and the blue sheet of the cellophane, which should be held close to the eyes. It will be noticed that the printing is now discernible only through the paper of the same color as the sheet of cellophane which is held before the eyes, i.e., the blue sheet is more opaque to red light and less opaque to blue light than is the red sheet.

The actual dependence of the instrument readings on color was studied by making observations on test sheets of the same sample with different filters inserted in the instrument between the light source and the lower photocell. A Wratten 44A filter and a Jena BG-18 filter were used as a bluish-green combination and a Wratten 29 filter and a Jena BG-18 filter as a red combination. The effective wave lengths of those

TABLE V

| Sample | Instrument readings in sec. Unfiltered | Blue filter | Red filter |
|---|---|---|---|
| 1 white | 2.6 | 4.1 | 3.4 |
| 2 white | 43.3 | 77.5 | 83.9 |
| 3 yellow | 43.9 | 97.1 | 25.2 |
| 4 pink | 53.1 | 120.6 | 34.5 |
| 5 buff | 54.5 | 85.1 | 39.5 |
| 6 green | 105.7 | 91.2 | 93.7 |
| 7 blue | 66.6 | 100.7 | 76.4 |
| 8 gray | 142.6 | 155.4 | 124.3 |
| 9 white | 150.2 | 223.4 | 167.8 |
| 10 white | 59.7 | 85.5 | 44.9 |
| 11 white | 439 | 699 | .. |
| 12 brown | 964 | 1068 | .. |
| 13 | 1873 | 2520 | .. |

combinations, when used in the instrument, were estimated to be 500 and 640 millimicrons, respectively. The intensity of the light transmitted by those filter combinations was so low that it was necessary to use a more sensitive galvanometer in series with the one supplied with the instrument. Table V lists the observed instrument readings, with and without the filters, taken with the 80 per cent screen and with the water-soluble dye solution as the penetrating liquid. The samples were the ones used to obtain the data presented in Section I of this report.

Table VI lists similar values obtained with the recommended dyed oil solution and the 80 per cent screen for some of the same samples.

TABLE VI

| Sample | Instrument readings in sec. Unfiltered | Blue filter | Red filter |
|---|---|---|---|
| 3 | 54.3 | 54.3 | 38.6 |
| 4 | 35.4 | 93.2 | 20.3 |
| 5 | 229.4 | 461 | 168.1 |
| 6 | 1398 | 920 | 1565 |
| 7 | 759 | 541 | 755 |
| 8 | 910 | 785 | 647 |
| 10 | 451 | 699 | 333 |

Table VII lists similar values obtained with a

TABLE VII

| Sample | Instrument readings in sec. Unfiltered | Blue filter | Red filter |
|---|---|---|---|
| A | 48.1 | 77.4 | 48.9 |
| B | 60.0 | 77.8 | 50.9 |
| C | 74.4 | 129 | 86.8 |
| D | 61.5 | 81.8 | 55.7 |

[7] These samples may be obtained from The Institute of Paper Chemistry, or the original report may be obtained from the Secretary of The American Paper and Pulp Association.

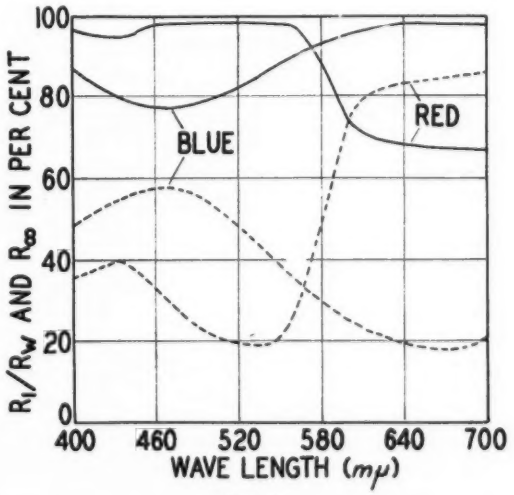


FIG. 9.

**Curves for Sample Supplied with the Original Report (7) Solid curves, ratio of reflectance of a single sheet backed by black body to that of a single sheet backed by magnesium carbonate. Dashed curves, spectral reflectivities of the same samples.**

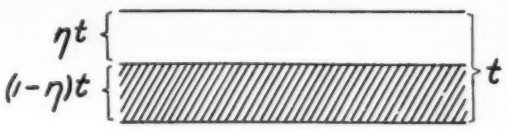


FIG. 10.

**An Idealized Section Through a Sheet of Paper Showing the Permeated Layer, $(1-\eta)t$, and the Unpermeated Layer $\eta t$.**

mimeograph ink and the 80 per cent screen for four mimeograph papers. In this case the red filter combination consisted of the Wratten 29 filter alone, the Jena BG-18 filter being omitted.

Measurements made with the instrument are thus seen to be dependent on the color of the paper. Furthermore, the observations show that the instrument readings are dependent on the opacity of the sheet, because, when a sample is examined in the instrument with and without filters, that ideal situation obtains in which the only variable is the opacity of the sample to the particular beam of light transmitted by the filters. Effectively, sheets of identical physical properties, except for opacity, are studied.

## SECTION V

### Theory of the Instrument

An idealized theory of the instrument's operation may be presented as follows:

Assume, as in Section IV, that the penetrating liquid is perfectly black, that the sheet is homogeneous, and that the liquid penetrates (without adsorption of dye) as a layer having a plane boundary. Fig. 10 is a schematic section of a sheet of paper at some time during the period of a test.

Let us call $t$ the thickness of the sheet, and $\eta$ the fraction of the sheet that is as yet unpenetrated by the liquid, i.e., $(1 - \eta)t$ is the distance the liquid has penetrated.

The Kubelka and Munk[8] formula for the fraction of the incident monochromatic light scattered by a layer of thickness $x$, whose reflectance is $R$ and the reflectivity of whose material is $R\infty$, is

$$Sx = \frac{R_x}{1 - R^2_x} \log \frac{(1 - RR_x)R_x}{R_x - R}, \qquad (1)$$

where $S$ is the fraction of the incident light scattered by a layer of unit thickness. Multiplying both sides of the equation by $(1 - R^2\infty)/R\infty$, taking the antilogarithm of both sides of the equation, and replacing $x$ by $\eta t$, the thickness of the scattering layer for the case here considered, there results

$$\frac{(1 - RR_x)R_x}{R_x - R} = e^{\frac{1 - R^2_x}{R_x} S\eta t}. \qquad (2)$$

Solving this equation for $R$, one obtains

$$R = R_x \frac{e^{\frac{1 - R^2_x}{R_x} Snt} - 1}{e^{\frac{1 - R^2_x}{R_x} S\eta t} - R^2_x}. \qquad (3)$$

At the beginning of the test, before the liquid is brought into contact with the sample, $\eta = 1$. At that

[8] Kubelka, P., and Munk, F., Z. tech. Physik 12:593 (1931).

time equation II may be written as follows, with $\eta$ replaced by 1, and $R$ replaced by $R_1$:

$$\epsilon^{\frac{1-R^2_\infty}{R_\infty}St} = \frac{(1-R_1R_\infty)R_\infty}{R_\infty - R_1}. \quad (4)$$

It will be noticed that the left hand member of equation IV appears in the right hand member of equation III, in which equation III is it raised to the power $\eta$. Therefore, substitution of equation IV in equation III results in the following:

$$R = R_\infty \frac{\left[\frac{(1-R_1R_\infty)R_\infty}{R_\infty - R_1}\right]^\eta - 1}{\left[\frac{(1-R_1R_\infty)R_\infty}{R_\infty - R_1}\right]^\eta - R^2_\infty}. \quad (5)$$

For convenience in manipulation, the quantity given on the right hand side of equation IV may be represented by $a$. Equation V then becomes

$$R = R_\infty \frac{a^\eta - 1}{a^\eta - R^2_\infty}. \quad (6)$$

In the actual use of the instrument, penetration proceeds until the reflectance falls to a fraction, say $\epsilon$ (where $\epsilon$ is the transmission of the particular screen), of the initial reflectance, $R_1$, of the single sheet. Equation VI becomes, therefore, at the end of the test

$$R = \epsilon R_1 = R_\infty \frac{a^\eta - 1}{a^\eta - R^2_\infty}. \quad (7)$$

Solving this equation for $\eta$ and replacing $a$ by its equivalent, the right hand member of equation IV, one has

$$\eta = \frac{\log \frac{1-\epsilon R_1 R_\infty}{1-\epsilon R_1/R_\infty}}{\log a} = \frac{\log \frac{1-\epsilon R_1 R_\infty}{1-\epsilon R_1/R_\infty}}{\log \frac{1-R_1R_\infty}{1-R_1/R_\infty}}. \quad (8)$$

Thus, if the instrument employed a monochromatic light source and the reflectance and reflectivity of the sample were known for light of that same wave length, equation VIII would permit calculation of the fraction of the sheet, $1-\eta$, that had been penetrated when the reflectance had fallen to a fraction $\epsilon$ of its initial value.

Equation VIII may be put in a form which is more convenient for calculation by making the following substitutions:

$$\begin{aligned} R_\infty - R_1 &= \delta, \text{ and} \\ R_1/R_\infty &= 1-\delta/R_\infty. \end{aligned} \quad (9)$$

The result of making these substitutions in equation IX is:

$$\eta = \frac{\log \frac{1-\epsilon R_\infty(R_\infty - \delta)}{1-\epsilon(1-\delta/R_\infty)}}{\log \frac{1-R_\infty(R_\infty-\delta)}{1-(1-\delta/R_\infty)}}. \quad (10)$$

This equation was used to calculate the values of $\eta$ for various values of $\delta$ and of $R\infty$ for the two cases $\epsilon = 0.80$ and $\epsilon = 0.33$. Figs. 11 and 12 show the families of curves[9] which result from plotting the calculated values of $\eta$ as a function of $R\infty$.

Values of $\eta$ may also be obtained from the curves drawn according to the Kubelka and Munk formula by the Colorimetry Section of the National Bureau of Standards. Their chart is entitled "Diagram Showing Interrelation of Reflectance, $R_o$, Reflectivity, $R\infty$, and TAPPI Opacity, $\iota_{0.89} = K_o/K_{0.89}$." The method of obtaining values of $\eta$ from those curves is the following: The $R_o$ of the Bureau of Standards chart is the equivalent of the $R_1$ used in this report. The ordinate corresponding to the observed $R_1$ of the sample is found. The intersection of that ordinate with the $R\infty$ curve corresponding to the observed $R\infty$ of the sample locates a point on the chart. The value of $Sx$, $(Sx)_1$, for that point is then obtained from the $Sx$ curves which cut across the $R\infty$ curves. Similarly, a value of $Sx$, $(Sx)_2$, is found for the observed $R\infty$ of the sample and a value of $R_o$ equal to $\epsilon R_1$. The ratio, $(Sx)_2/(Sx)_1$, is then the value of $\eta$.

The agreement of calculations based on this theory and the actual experimental results cannot be checked directly since the instrument does not have a monochromatic light source, as the theory requires. The results can be made approximately those of a monochromatic light source by using filters with the instrument. If the reflectance and reflectivity of the sample are determined for the effective wave length[10] of the instrument when so fitted with filters, agreement might be expected.

The results presented in Section IV were obtained for the dual purpose of showing the dependence of the instrument readings on color and opacity of the sample and of testing this theory. The reflectance and reflectivity of a number of the samples previously described were determined on the General Electric Reflection Meter, using the number 4 and number 8 filters. Those filters gave reflectances and reflectivities for nearly the same effective wave lengths as those characteristic of the News Penetration Tester when the filter combinations described in Section IV were used.

The method of calculation was the following: The values of the reflectivity and reflectance of the sample at a given effective wave length were used to calculate $\delta$ from equation IX. Then the value for $\eta$ for the desired screen, say the 80 per cent screen, was found by using the curves of Fig. 11. The abscissa corresponding to the reflectivity of the sample was located, and the ordinate which passed through the intersection of that abscissa and the $\delta$ curve (actual or interpolated) corresponding to the observed $\delta$ of the sample was found. The value of $\eta$ thus obtained was the theoretical fraction of the sheet which was not penetrated when the reflectance of the sheet for that effective wave length had fallen to 80 per cent of its initial value.

It has been shown that the time of penetration of liquids through paper should be approximately proportional to the square of the thickness of the transuded layer. Carson[5], among others, has found the use of that relationship essential when a comparison is to be made between samples of different caliper for which the intrinsic rate of penetration is desired. In the present case, the value of $(1-\eta)$ was the fraction of the sheet which was transuded. If that value was multiplied by the caliper of the sheet, the

[9] Photostat copies of the original curves, from which Figs. 11 and 12 were reduced, are available through The Institute of Paper Chemistry.

[10] The effective wave lengths of the instrument are determined by the relative spectral energy distribution of the light source, by the spectral transmission of the filter, by the spectral reflectance of the sample, and by the spectral response of the photocell. The interested reader will find further discussion of effective wave lengths in Instrumentation Studies XX, Section IV, under division S4 (Paper Trade J. 105, no. 19:27-39, (Nov. 4, 1937) ) and in Instrumentation Studies XXI, footnote 1 (Paper Trade J. 105, no. 20:00-00 (Nov. 11, 1937).

theoretical thickness of the transuded layer was obtained. The square of that thickness should be proportional to the observed time of penetration. In practice, it was of more interest to reduce the times to those for unit caliper by dividing the observed times by the square of the caliper of the sample. Those reduced times should then be proportional to the square of the quantity $(1-\eta)$. The theory predicts that the ratio of the reduced time to the square of the quantity $(1-\eta)$ should be constant for a given sample, i.e., should be independent of the effective wave length of the light used. Furthermore, the intrinsic rates of penetration of different samples should be measured by the values of those ratios.

Table VIII summarizes the results of the measurements and calculations on a number of samples. Column 2 describes the filter combination which was used, *G* signifying the combination whose effective wave length was in the blue-green region of the spectrum and *R*, the red combination. Columns 3 and 4 list the reflectivity and reflectance, respectively, of the samples for the effective wave length indicated in column 2. Column 5 gives the values of the quantity $(1-\eta)$ as obtained from the curves of Fig. 11 for the 80 per cent screen. Column 6 presents the values of the instrument readings for the penetration of the dyed water solution. They are reduced times measured with the 80 per cent screen.

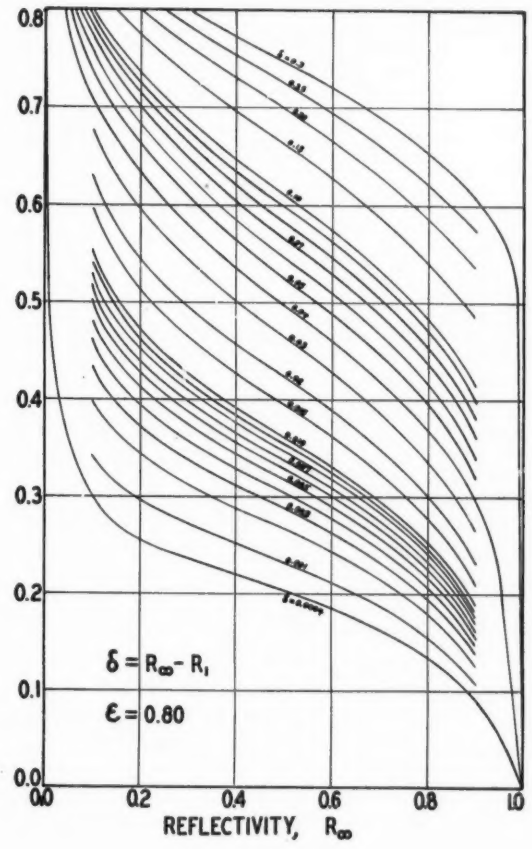


FIG. 11.
Curves Showing $\eta$, the Fraction of the Sheet Not Transuded, as a Function of the Reflectivity, $R_x$, for Various Values of $\delta = R_\infty - R_1$ for the 80 Per Cent Screen.

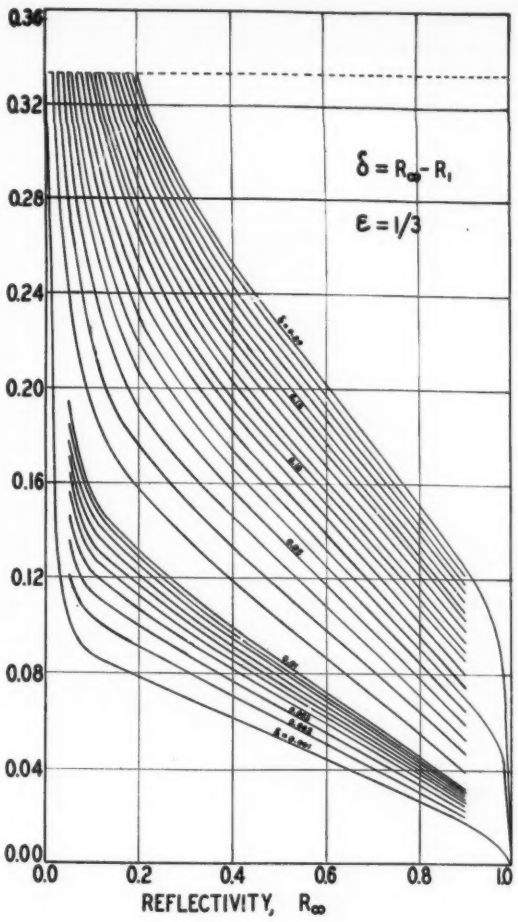


FIG. 12.
Curves Showing $\eta$, the Fraction of the Sheet Not Transuded, as a Function of the Reflectivity, $R_x$, for Various Values of $\delta = R_\infty - R_1$ for the 30 Per Cent Screen.

Column 7 lists the values of the ratio which should be constant for a given sample. Columns 8, 9, and 10 list the values of $(1-\eta)$, the reduced times, and the ratios for the penetration of the dyed water solution when measured with instrument and the 30 per cent screen. In the second part of Table VIII columns 1 to 5 inclusive are the same as the corresponding columns of the first part of the table. Columns 6 and 7 give the reduced times and ratios for the penetration of undyed castor oil, and columns 8 and 9 list the corresponding values for the penetration of the dyed castor oil solution.

Table IX lists similar values for observations with the 80 per cent screen on the penetration of a mimeograph ink through four mimeograph papers.

It is seen that the values of the ratio $T/(1-\eta)^2$, given in Tables VIII and IX, are not constant for a given paper, but depend on the color of the light. However, in all but three instances, the two ratios are more nearly equal than the corresponding times. Those three cases are: that of the penetration of the dyed water solution through sample 6, and those of the penetration of the dyed water solution and the undyed castor oil through sample 7. Hence, although the idealized theory of the instrument does not de-

scribe the experimental results accurately, it does tend in the right direction.

The lack of better agreement between the theory and the experimental results is not surprising in view of the demonstrated fact that the penetrating solutions do not fulfill the requirement of the theory, viz., that of penetrating liquid being perfectly black. A more applicable theory would be one which described the penetration of a colorless liquid through the sheet. The results of such a consideration are too complicated to be expressed in useful form.

TABLE VIII

| Sample | Filter | $R_\infty$ | $R_1$ | Dyed Water 80% screen (1-η) | T | T/(1-η)² | Dyed Water 30% screen (1-η) | T | T/(1-η)² |
|---|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) | (10) |
| 1 | G | 77.04 | 72.48 | 0.599 | 1.63 | 4.54 | 0.919 | 101 | 120 |
| | R | 85.54 | 75.44 | 0.542 | 1.35 | 4.59 | 0.905 | 76.9 | 91.9 |
| 2 | G | 60.98 | 59.68 | 0.651 | 52.8 | 124 | 0.925 | 5.65 | 6.60 |
| | R | 74.98 | 68.94 | 0.554 | 57.1 | 186 | 0.918 | 5.04 | 5.98 |
| 3 | G | 53.64 | 51.16 | 0.568 | 72.5 | 225 | | | |
| | R | 84.48 | 64.76 | 0.440 | 18.8 | 97.0 | | | |
| 4 | G | 54.48 | 52.28 | 0.582 | 87.2 | 257 | | | |
| | R | 86.96 | 66.54 | 0.444 | 25.0 | 127 | | | |
| 5 | G | 33.74 | 33.54 | 0.697 | 61.6 | 127 | | | |
| | R | 67.74 | 60.04 | 0.489 | 28.6 | 119 | | | |
| 6 | G | 46.48 | 44.90 | 0.586 | 68.1 | 198 | | | |
| | R | 21.78 | 21.74 | 0.750 | 70.0 | 124 | | | |
| 7 | G | 66.50 | 60.16 | 0.509 | 68.3 | 264 | | | |
| | R | 39.52 | 38.54 | 0.607 | 51.8 | 140 | | | |
| 8 | G | 40.68 | 40.32 | 0.681 | 112.2 | 242 | | | |
| | R | 44.44 | 43.64 | 0.637 | 90.0 | 222 | | | |
| 9 | G | 76.68 | 75.78 | 0.736 | 240.0 | 443 | | | |
| | R | 83.76 | 79.66 | 0.647 | 180.1 | 430 | | | |
| 10 | G | 77.08 | 66.64 | 0.495 | 74.8 | 305 | | | |
| | R | 74.78 | 63.50 | 0.480 | 39.3 | 170 | | | |

TABLE VIII (Cont.)

| Sample | Filter | $R_\infty$ | $R_1$ | Undyed Castor Oil 80% screen (1-η) | T | T/(1-η)² | Dyed Castor Oil 80% screen T | T/(1-η)² |
|---|---|---|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) | (9) |
| 3 | G | 53.64 | 51.16 | 0.568 | 40.7 | 12.6 | 40.5 | 12.5 |
| | R | 84.48 | 64.76 | 0.440 | 17.0 | 8.78 | 28.8 | 14.9 |
| 4 | G | 54.48 | 52.28 | 0.582 | 26.4 | 7.78 | 67.4 | 19.9 |
| | R | 86.96 | 66.54 | 0.444 | 14.5 | 7.35 | 14.7 | 7.45 |
| 5 | G | 33.74 | 33.54 | 0.697 | 197 | 40.5 | 334 | 68.5 |
| | R | 67.74 | 60.04 | 0.489 | 91.9 | 38.4 | 122 | 50.8 |
| 6 | G | 46.48 | 44.90 | 0.586 | 396 | 115 | 686 | 199 |
| | R | 21.78 | 21.74 | 0.750 | 737 | 131 | 1168 | 208 |
| 7 | G | 66.50 | 60.16 | 0.509 | 551 | 212 | 368 | 142 |
| | R | 39.52 | 38.54 | 0.607 | 463 | 125 | 511 | 138 |
| 8 | G | 40.68 | 40.32 | 0.681 | 441 | 95.0 | 568 | 122 |
| | R | 44.44 | 43.64 | 0.637 | 304 | 74.9 | 468 | 115 |
| 10 | G | 77.08 | 66.64 | 0.495 | 553 | 226 | 611 | 249 |
| | R | 74.78 | 63.50 | 0.480 | 258 | 112 | 292 | 127 |

TABLE IX

| Sample | Filter | $R_\infty$ | $R_1$ | (1-η) | Mimeograph ink 80% screen T | T/(1-η)² |
|---|---|---|---|---|---|---|
| A | G | 75.63 | 70.53 | 0.576 | 41.8 | 126 |
| | R | 78.19 | 70.17 | 0.524 | 26.4 | 96.4 |
| B | G | 75.79 | 70.39 | 0.570 | 45.1 | 139 |
| | R | 78.49 | 70.55 | 0.539 | 29.6 | 102 |
| C | G | 76.29 | 70.87 | 0.571 | 65.7 | 202 |
| | R | 76.21 | 69.69 | 0.551 | 44.3 | 146 |
| D | G | 76.08 | 70.70 | 0.573 | 43.8 | 134 |
| | R | 78.22 | 71.70 | 0.561 | 29.8 | 94.9 |

## SECTION VI

### Miscellaneous Features of the Instrument

The effect of the temperature of the test liquid on the instrument readings was noted by obtaining readings for the penetration of the dyed oil through two samples when the ink reservoir was maintained at several temperatures. Table X presents the results.

TABLE X

| Sample | Instrument readings in sec.; 80% screen 72°F. | 95°F. | 104°F. |
|---|---|---|---|
| 6 | 169.3 | .... | 119.6 |
| 23 | 46.6 | 26.8 | 18.5 |

The magnitude of the observed temperature effect is such as to require control of the temperature to within about 2 deg. F. if the relative ranking of samples is desired after appreciable intervals of time. The temperature control incorporated in the instrument controls only the temperature of the ink reservoir, not the temperature of the sample. Even though the temperature of the reservoir is kept at a constant value, the temperature at which the penetration proceeds will depend upon the ambient temperature, particularly for samples which are penetrated slowly, i.e., for the cases in which the ink pot is out of the reservoir for relatively long periods of time so that the ink slowly cools from its initial temperature. It appears likely that the instrument would be unsatisfactory for control work throughout the year unless it was used in a constant temperature room.

A brief test showed that a six volt variation from the normal voltage of the a.c. mains caused no appreciable change in the instrument readings. The lamp bulb showed no signs of aging after three weeks of continuous daily use.

It was at first thought that the internal agreement of the readings on the individual sheets of a sample was indicative of the reproducibility of the instrument readings. It was found, however, that the average readings on some samples varied from time to time by amounts greater than those to be expected from the internal agreement. Table XI shows the readings taken at different times on a number of samples. The mimeograph paper had been under the standard conditions of humidity for six months when the first readings were taken. The news print and the all rag samples had been under the standard conditions for seven and two days, respectively, when the first readings were taken. The readings refer to the penetration of the dyed water solution measured with the 80 per cent screen.

TABLE XI

| Sample | Initial reading (sec.) | Reading 14 days later (sec.) |
|---|---|---|
| 11 (mimeo) | 439.4 | 884 |
| 2 (news print) | 43.3 | 98.2 |
| 7 (all rag) | 66.6 | 72.7 |
| 8 (all rag) | 142.6 | 140 |
| 6 (all rag) | 105.7 | 116 |

The observed variations for the mimeograph paper and the news print could not be ascribed to temperature changes or differences in the height of the meniscus of the test liquid. The sample for each reading consisted of five test sheets which were cut from each of five 17x22 inch sheets of the particular paper. All samples of a particular paper were cut from the same five large sheets. It is felt that the observed variations recorded in Table XI were not due to variations in the samples. Watermarked pieces were discarded. The felt side of all test pieces was placed in contact with the test liquid.

## SECTION VII

### Fundamental Criticism of the Instrument

We agree with the manufacturers that an instrument designed to measure the rates of penetration of liquids through paper should yield data which are independent of the opacity, color, and other sheet properties not directly related to the permeability of the paper to liquids. The experimental observations and the theory of the Barss, Knobel, and Young News Penetration Tester show that the instrumental readings are definitely dependent on the color and opacity of the paper. This fact constitutes a fundamental and serious objection to the use of this instrument.

# Review Of The Paper Industry Literature

Abstracts Compiled By the Abstracts and Bibliography Committee of the Technical Association of the Pulp and Paper Industry, A. Papineau-Couture, John F. Ohlson and Clarence J. West, Chairman of the Committee.

**Copies of United States Patents can be obtained from the United States Patent Office, Washington, D. C., for 10 cents each. Send currency, not stamps.**

## Pulp and Paper Testing

**Microscopic Investigation of Unbleached, Half Bleached and Bleached Sulphite and Sulphate Pulps.** Bruno Schulze. Papier-Fabr. 35, No. 4: 25-29; No. 5: 37-39 (Pan. 22, 29, 1937).—The preparation of the various stains, tests for determining the degree of cooking, etc. are given in detail, and then the color reaction with each of the stains. A very thorough study of the subject.—J.F.O.

**Sulphite Pulp Capable of Parchmentization.** Ott Wurz. Papier-Fabr. 35, No. 7: 54-56; No. 8: 57-60 (Feb. 12, 19, 1937).—The author first gives a brief description of the anatomy of the plant cells of spruce and raw cotton, then over the pectin lamellen of sulphite pulp, coloring the fiber with ruthenium experiments in the beater, manufacture of an easily parchmentizable sulphite pulp, and in conclusion, the testing of commercial pulp for its parchmentizing ability. Materials such as bleached cotton, alpha pulp and very soft pulps which gave a very weak color with ruthenium red stain were unsatisfactory for making grease-proof paper. On the other hand, material which gave the red color with the pectin lamellen made a good grade of grease-proof paper after more or less beating. In cooking sulphite pulp, conditions must be such that the pectin lamellen can be swelled without difficulty. The wood chips should be large, a low sulphur dioxide content and high CaO acid, low temperature and pressures during cooking are amongst the factors favoring a parchmantizable pulp.—J.F.O.

**A Method for Distinguishing Between Bleached and Unbleached Wood Pulp.** Oskar Singer. Papier-Fabr. 35, No. 3: 23-24 (Jan. 15, 1937).—Description of the method which, in addition to the above, distinguishes half-bleached.—J.F.O.

**Drainage Characteristics: Laboratory Studies.** W. Boyd Campbell and William C. Lodge. Pulp Paper Mag. Can. 38: 189, 200 (1937).—The freeness test, while indicative of the drainage rate of stock on the table roll part of the machine, does not indicate well the characteristic of drainage on the suction area of the wire. Studies made with the object of eventually arriving at a test indicative of the latter property are briefly described, but no conclusions reached. The question is presented as to whether this test should show the dryness obtainable under some fixed condition or whether it should show a measure of the resistance to the flow of water through sheets compacted as in the suction area.—A.P.-C.

**The Test for Tearing Resistance.** Marion Winterbottom and Jessie E. Minor. Paper Industry 18: 928-930 (Feb., 1937).—There is a decided tendency to increase tear tests with weight more than would be expected from relative weights. It is suggested that, in order to reduce to a minimum possible discrepancies from this source, the instruction of the test be modified to read that all tests shall preferably be made on single samples except in those cases where such values are too low for accuracy, but that in no case should sheets be doubled to give a value of over 30 on the scale.—A.P.-C.

**The Johnston Screen Classified: Action on Various Pulps.** W. Boyd Campbell and Wm. C. Lodge. Pulp Paper Mag. Can. 38: 75-76 (1937).—A study of the action of the Johnston screen classifier on various pulps showed that the division of the pulps into fractions was reproducible. The distribution of fiber lengths in the various fractions is fairly uniform in groundwood and in coniferous sulphite, but there is a different distribution in the finer fractions of birch sulphite. Curves are given showing the distribution of the fiber lengths in ordinary and very coarse groundwoods, unbeaten and beaten bleached coniferous sulphites, and bleached birch sulphites.—A.P.-C.

**The Fiber Weight-Length Method of Micrographic Analysis.** Adrien Albarranc. Paper 40: 39-44 (Jan., 1937).—An explanation of the Spence-Krauss method and its merits.—A.P.-C.

**The Optical Characteristics of Paper. III. The Opacifying Power of Fibers and Fillers.** F. A. Steele. Paper Trade J. 104, No. 8: 157-158 (Feb. 25, 1937).—The previous adaptations of the Kubelka-Munk equations can be used to determine the individual contribution of the components of paper to its opacity. The relative opacifying powers of various fibers and fillers are presented.—A.P.-C.

**Paper Properties of Interest to the Printer: Their Definitiion and Evaluation.** Jullian. Papier 40: 55-61 (Jan., 1937).—A brief general discussion.—A.P.-C.

**The Oil-Paper Relationship in the Printability of Paper.** G. L. Larocque. Pulp Paper Mag. Can. 38: 77-84 (1937).—A method has been developed, and is described, for determining the magnitude of the capillary pressure causing the natural penetration of oil into paper and for determining the mean effective radius of the capillary pores. Oil absorption measurements with three different oils showed that the penetration is proportional to the quotient Surface-Tension Viscosity of the oil employed, and supported the contention that absorption takes place in accordance with the known laws that govern the capillary flow of liquids into porous bodies. The variation in absorption time with temperature depends solely on changes in oil viscosity. Increase in atmospheric relative humidity results in a marked and irreversible decrease in the magnitude of the oil absorption. A new apparatus and technic are described for measuring a hitherto undetermined printing property of paper, viz., the oil absorptiveness of the paper surface. Comparison of this test with oil flotation

measurements showed that the latter depend on the penetration of an excess of oil through the sheet and are not a measure of the absorptiveness of the paper surface for printing oil.—A.P.-C.

**Report of the Committee on Physical and Chemical Standards.** C. A. Sankey, et al. Pulp Paper Mag. Can. 38: 193-196 (1937).—A summary of developments during 1936 in the field of standards, of interest to the pulp and paper industry, with bibliography of 107 references.—A.P.-C.

**Evaluation of Fastness to Light of Colored Materials.** S. Pestalozzi. Zellstoff u. Papier 17, No. 2: 53-57 (February, 1937).—The author discusses light in general, various fastness of a color on different materials, the source of light and measuring its intensity, the use of this light for determining the fastness of a color, influence of moisture and temperature, and various methods for the evaluation of the results.—J.F.O.

**Experiments With the New Schopper Durability Bending Tester in Comparison With the Paper Fold Tester.** Korn. (Dec. 12, 1936). Papier-Fabr. 35, No. 5: 33-37 (Jan. 29, 1937).—Certain disadvantages of the fold tester are first discussed and then the durability bending tester as an instrument which eliminates these faults. Several different types of paper are then tested with both testers and under different loads, and curves drawn to show the relationship.—J.F.O.

**The Camera Microscope, an Important Step for Microphotography.** Hugu Freund. Wochbl. Papierfabr. 68, No. 11: 207-10 (March 13, 1937).—Description of the operation and construction of camera microscopes made by the Ernst Leitz company.—J.F.O.

**Testing of Paper, Carton and Board for Durability.** Alfred Schopper, Leipzig. Wochbl. Papierfabr. 68, No. 6: 97-101; No. 7; 119-24 (Feb. 6, 13, 1937).—After a detailed discussion of the mechanics of bending, the author describes a new apparatus for testing the bending endurance of cellulose products. Numerous drawings, curves and other data are presented to illustrate the value of bending tests in evaluating paper and studying the influences of the various steps in the manufacture.—J.F.O.

**Measuring the Conductivity of Extracts From Paper.** A. Lamertz and Bruno Schulze. Zellstoff u. Papier 17, No. 3: 104-106 (March, 1937); Wochbl. Papierfabr. 68, No. 8: 139-42 (Feb. 20, 1937).—The problem was to find out which paper qualities have the most effect on the electrical properties of condensor paper. It was shown that paper with the greatest puncturing resistance was the poorest insulator. The methods of Jander and Schorstein were found to be the best and a description of these is given.—J.F.O.

**Paper for Electrical Purposes. Specification of the British Bureau of Testing Materials.** Zellstoff u. Papier 17, No. 3: 106-109 (March, 1937).—The tests and methods of carrying out such are described.—J.F.O.

**The Erasing Knife, an Expedient in Paper Testing.** Papier-Ztg. 62, No. 15: 218, 220 (Feb. 20, 1937).—Reference is made to the suitability of the erasure test for quickly differentiating high quality papers from cheap mass products; the quality of the paper is the better, the less the surface is roughened by erasing with a sharp knife. The test can also be applied for differentiating full sized from surface sized papers. High class drawing paper is beater as well as surface sized; hence the ink will not spread when writing over an erased spot.—C.J.W.

## Paper Conditioning

**Maturing of Paper.** Arnold Ingram Macnaughton. Svensk Pappers-Tidn. 40, No. 4: 77-81 (Feb. 28, 1937).—In order to obtain the thoroughly matured paper needed if close register is to be obtained in color work, or flat paper to be manufactured for ruling, book making, or writing papers, artificial means must be taken to ensure the proper maturing of the sheet. The author describes three paper-maturing machines installed at the Croxley fine paper mills in England, the first of which was constructed in 1910. The latest type of construction is very compact, resulting in considerable saving of floor space. This was accomplished by keeping the damp air passing over the surface of the sheet in turbulent flow. A paper conditioning plant at present concerns only makers of fine papers and boards; the author, however, confidently anticipates that "matured" will be included in the specifications of many technical and cheaper papers of the future. It is particularly valuable in the case of paper destined for export to the tropics where relative moistures tend to run much higher than in temperate regions. A number of illustrations are included, showing details of the equipment and two loads of paper cut from the same making. In one the paper was run through the maturing machine and lies perfectly flat; in the other the paper was cut direct from the reel and is wavy. Paper which has once been matured is never so reactive to moisture as it is in the unmatured condition.—C.J.W.

## Pulp Purification

**Pulp Purification According to the Patent Literature.** George Jayme, Darmstadt. Papier-Fabr. 35, No. 1: 2-8 (Jan. 8, 1937).—Reference is made to 60 patents throughout the pulp producing countries on the subject of pulp purification. These patents are classified into several main groups according to procedure of treatment; that is, cold treatment, hot treatment, etc. The finished pulps are then classified as follows: artificial leather, high absorption, slightly purified pulp; viscose artificial silk, normal pre-ripened, likewise slightly purified; cellulose wool, slightly quicker pre-ripening, also slightly purified; viscose foil, very quick or not pre-ripened; paper, strong, not bleached too white, lightly purified; cellulose ether, also lightly purified pulp of high, medium or low viscosity according to use; nitro cellulose, high absorption, high bleach, medium or low viscosity, lightly purified, loose sheets; paper, tough, purified, half bleached kraft pulp or about 93 per cent alpha cellulose; rag substitute pulp and plastics, hot purification, high bleached of 93 to 96 per cent alpha cellulose; copper silk, high white, hot or cold purified spruce or deciduous pulps of at least 94 per cent alpha; wet-strong cellulose foil, high white, hot or cold purified pulp of at least 96 per cent alpha; paper, soft, opaque printing paper, high white, hot purification deciduous wood alpha pulp; high quality nitro cellulose, hot purified of high, medium or low viscosity and 93 to 96 per cent alpha cellulose, loose sheets; and cellulose acetate and cellulose esters, cold purified, high white, high absorption pulp of at least 98 per cent alpha cellulose.—J.F.O.

**Possible Reduction of the Contents of Resinous**

**Matter in Viscose Cellulose.** V. V. Plyushkevich and P. P. Shirikov. Bumazhnaya Prom. 15, No. 10: 67-72 (Oct., 1936); C. A. 31:2413.—Inconclusive results of laboratory and large-scale experiments in the reduction of contaminating resinous material in viscose are tabulated and described.—C.J.W.

### Paper Specialties

**Curing of Gummed Paper.** Kartonnagen- u. Papierwaren-Ztg. 40, No. 33: 353 (1936); Tech. Bull. 14, No. 1: 2 (Jan., 1937).—Curling of gummed paper can be due to the composition of the paper; thus paper containing much straw pulp very easily curls under the influence of moisture. The beating of the pulp has considerable effect on curling; thus papers for gumming should be specifically ordered for that purpose. Papers containing much clay tend less to curl. The best gum is one of high adhesive power which can be applied thinly. A thin application is, however, impossible in the case of absorbent paper where more gum must be used and the danger of curling occurs. To prevent curling as much as possible, add to each kilogram of adhesive 7-8 g. of aluminum sulfate dissolved in water, as well as a little sugar dissolved in 30-40 g. glycerin. If glycerin is used alone, then 40-50 g. should be employed; if a larger quantity of glycerin is used the end is defeated. The best temperature at which to work gummed paper is 18°C.—C.J.W.

**Waterproof Pasted Linings.** Kartonnagen- u. Papierwaren-Ztg. 41, No. 4: 33-34 (Jan. 22, 1937).—The manufacture of actually waterproof linings presents a problem in so far as good adhesive properties with ordinary glues is contradictory to absolute waterproofness. Satisfactory linings must be thoroughly penetrated by the proofing agent throughout the entire thickness of the web, have high strength properties, especially flexibility, and be resistant to certain chemicals, alkalies (soaps) in particular. Papers sized in the beaters with bituminous emulsions have been found suitable for this purpose. Unbleached sulfite or soda pulps are best; an addition of a maximum of 30 per cent asphalt is usually sufficient and imparts a flexible, rubber, or leatherlike character to the paper. The color is generally dark brown or black; however, special asphalts can be dyed and yield beautiful lighter shades. To increase the bonding strength, the impregnated layer on its lower side is couched to a non-treated web, which unites firmly with the waterproof cover, retains its glue absorbing properties, and insures excellent bonding between lining and board.—C.J.W.

**New Processes for the Manufacture of Crepe Paper.** Wochbl. Papierfabr. 68, No. 6: 101-102 (Feb. 6, 1937).—The author briefly mentions the widening use of crepe paper and then describes several of the latest patents pertaining thereto.—J.F.O.

**Paper as a Work Material and Technical Product.** A. Foulon. Wochbl. Papierfabr. 68, No. 2: 22-23 (Jan. 10, 1937).—Numerous patents are cited for overcoming or lessening obstacles in the manufacture of various materials. For instance, in the manufacture of bituminous board, there is a patent preventing the bituminous material from adhering to the machinery. A patent is also given for removing the last traces of moisture from board.—J.F.O.

**The Use of Paper Yarn in Recent Times.** Willi Beha. Wochbl. Papierfabr. 68, No. 9: 158-160 (Feb. 27, 1937).—The article concerns itself chiefly with uses for paper yarn, and stressing the fact that paper yarn must not be considered as a cheap substitute for in many cases it serves its purpose as well as the material it replaces. Cable yarn from paper is widespread.—J.F.O.

**Process and Device for the Manufacture of Paper, Board and Carton, and Similar Materials and for the Purification and Fiber Recovery From the White Water.** Karl W. Volle, Duren. Ger. pat. 638,623 (Feb. 22, 1933).—J.F.O.

**Process for the Manufacture of Especially Hard, Smooth and Highly Polished Printing Paper.** Erich Schmidt, Nurnberg. Ger. pat. 638,815 (May 3, 1933).—The paper is coated with a pigment content glycerin phthalic acid resin laquer.—J.F.O.

**Process for the Manufacture of a Water Repellent and Fire Resistant Fibrous Material, Especially Paper and Board.** Brick Trust Ltd., London. Ger. pat. 639,137 (May 16, 1934).—The material is coated or drenched with a higher fatty acid or an insoluble salt of the same. The fire resistant material is a mixture of two solutions, one containing alkali tungstenate, borate or phosphate, the other an aqueous mixture of ammonia with phosphorous oxychloride. Finally the material is treated with formaldehyde to harden it.—J.F.O.

**Process for Impermeabilizing Special Papers.** Société d'Études et de Construction de Matériel de Protection. Fr. pat. 803,962.—In order to render it capable of retaining dust and poisonous fumes, paper is impregnated with a solution of a metal soap in an organic solvent.—A.P.-C.

**Multi-Ply Paper and Process for Its Manufacture.** Harald Hestnes. Fr. pat. 804,234.—Two or more plies of paper, at least one of which is creped, are united by a sheet or film of waterproof, elastic material, such as natural or synthetic rubber.—A.P.-C.

**Cigarette Paper.** Eva Maria Roschmann. Fr. pat. 801,568.—Cigarette paper is impregnated with a 0.2 per cent agar-agar solution.—A.P.-C.

**Embossed Paper.** Smith, Stone and Knight, Ltd., and Thomas P. Smith. Brit. pat. 452,370 (Aug. 17, 1936).—Pliable straw paper, thin cardboard, etc., for packing bottles, etc., is embossed, etc., with spaced, hollow indentations and incorporates paper makers' pitch, i.e., bitumens and solid and other residues from oil and other distillations, insoluble in alcohol, etc. The "pitch" may be added to the paper pulp or applied molten to the paper before the embossing by steam-heated rolls, by a bath, etc., or two or more lies of paper may be simultaneously treated so as to retain between them "pitch" which is forced into the interstices by pressure.—A.P.-C.

**The Splicing of Paper.** Horace Freeman and Lucien Morin. Pulp Paper Mag. Can. 38: 168-169 (1937).—Usual methods of splicing paper are reviewed and two new methods are described; one, using a cellulose acetate film moistened with a solvent, gives a heat resistant splice and is used for waxing papers; the other, using a vinyl acetate resin film, is used principally for news print. The advantages of the new methods are described.—A.P.-C.

**Process and Apparatus for Embossing Paper or Board.** Veuve P. Chouanard et Fils. Fr. pat. 805,184.—The embossing element instead of being a roll is an endless woven wire belt which is pressed into contact with the paper or board as the latter is being passed through a press.—A.P.-C.

**A General Survey of the Chinese Drawing-Paper Industry.** Chao-Chi Wei. Ind. Research

(China) 5: 481-488 (1936).—A description of the process with illustrations and suggestions for improvements.—A.P.-C.

**Impregnation of Paper and Associated Processes.** E. E. Halls. Ind. Chem. 12: 526-531, 567-571 (1936).—Methods of impregnating, various impregnating agents, and their recovery, are discussed. The moisture reabsorption and moisture permeability of papers before and after impregnation with different agents are compared; impregnation with bitumen is considered superior to that with wax.—A.P.-C.

**Production of Safety Paper.** A. H. Stevens, assignee of Todd Co., Inc. Brit. pat. 457,081 (Dec. 21, 1935).—A water-soluble substance (e.g., diphenylguanidine) which develops a color in presence of ink eradicators is printed on the paper after moistening, and the paper is subsequently dried and calendered. —A.P.-C.

**Process and Apparatus for Creping Paper.** P. J. Mouthiers. Belg. pat. 416,891 (Sept. 30, 1936).—Paper is pressed between two surfaces, at least one of which can be contracted after application of the paper thereto. Suitably, the paper is passed between two endless rubber belts, at least one of which is stretched transversely and is then allowed to contract to its normal width when the paper is on it.—A.P.-C.

**Method of Incorporating Special Materials With Paper Stock.** Wilbert L. Campbell, assignor to United States Gypsum Co. U. S. pat. 2,067,876 (Jan. 12, 1937).—Fillers such as gypsum are incorporated into the white water just before it is mixed with the stock.—A.P.-C.

**Method and Apparatus for Creping Paper Longitudinally.** Zellstoffabrik Waldhof and Rudolf Haas. Fr. pat. 805,907 (May 5, 1936); Belg. pat. 415,383 (Sept. 30, 1936).—The paper to be creped is passed under high tension around rotating roll, the axis of which is curved into an arc.—A.P.-C.

**Water-Resistant Decorated Paper.** Robert A. Voet, assignor to United Wall Paper Factories, Inc. Can. pat. 363,047 (Dec. 29, 1936).—A paper web is treated with a coating composition containing a solubilized casein binder, printed upon with an ink containing a pigment and a solubilized casein binder, the web at least partially dried, and the binders insolubilized with a solution of a formic acid salt of alkali or alkaline-earth metals, aluminum, or ammonium, adjusted to a pH value of approximately 4.8 to 5.5.—A.P.-C.

**Parchment Paper and Method of Making Same.** John A. Newman, assignor to Paterson Parchment Paper Co. U. S. pat. 2,067,501 (Jan 12, 1937). —The parchmentizing treatment is carried out in such a manner that the inner portion of the sheet is but feebly parchmentized. After washing and drying in the usual way one surface of the parchmentized web is passed over a roll which applies liquid paraffin; the sheet is passed between heated rolls under slight compression, wound while still hot, and allowed to cool.—A.P.-C.

**Concentration of Dilute Sulphuric Acid Containing Amyloid.** John R. Dufford, assignor to Paterson Parchment Paper Co. U. S. pat. 2,069,472 (Feb. 2, 1937).—Dilute sulphuric acid from the parchmentizing of paper is treated with a small amount of an oxidizing agent (preferably nitric acid, for 1 or 2 hours at 100° to 110°C.), which converts the carbonizable matter in the dilute acid into compounds which, during concentration of the acid, are oxidized without blackening.—A.P.-C.

**Decorating Sheet Material Such as Fibrous Floor Coverings.** Elbert A. Corbin, Jr., and Ellwood W. Wolf, assignors of one-third to William C. Biddle. U. S. pat. 2,060,041 (Nov. 10, 1936).—A sheet of printed tissue is placed over a sheet of "Japanese tissue" or the like and is laminated with it by a liquid rubber or latex composition and may be used as a decorative surface.—A.P.-C.

**Process and Apparatus for Manufacturing Artificial Leather.** Ernst Mahler and John B. Catlin, assignors to Paper Patents Co. U. S. pat. 2,069,257 (Feb. 2, 1937).—From 10 to 30 plies of light creped tissue paper are unwound in the form of two bats each made up from 5 to 15 plies from a pair of parent rolls and fed together into the nip of a horizontal 2-roll press. Rubber latex solution is continuously flowed into the roll nips on the outer side only of the bats. After slight pressing, the saturated sheet is passed to a drier. If thicker material is desired, similar tissue paper bats are applied to the outside of the sheet, and the whole is passed through a press similar to the first one, where latex is applied in the same way. As many additional such units are used as may be necessary to obtain the desired thickness.—A.P.-C.

## Kalamazoo TAPPI Discusses Drying

The Kalamazoo Valley Section of the Technical Association of the Pulp and Paper Industry met at the Park-American Hotel, Kalamazoo, Mich., December 10, 1937. W. F. Hathaway presided as chairman.

The speaker was John G. Callan Jr. of the Foxboro Company who talked on the subject "Why Not Bone Dry and Rehumidify?" This paper will be published soon in the PAPER TRADE JOURNAL.

Those present were as follows:

B. K. Asdel, H. F. Kleinman, J. W. Burke, Arthur G. Dries, P. M. Neumann, P. Eastonovich, E. A. Radant and M. J. Loveland, Hercules Powder Company.

M. H. Rutz, W. F. Hathaway, Frank Libby and C. W. Reade, Kalamazoo Vegetable Parchment Company.

Mike Redmond, Kalamazoo Paper Company.

H. Nendorf and E. F. Whittington, Rex Paper Company.

J. C. Widmeyer, W. A. Kirkpatrick, Joe Dennany and H. F. Johnston, Allied Paper Mills.

Sigmund Lindner and Merle R. Wilkins, Bryant Paper Company.

H. E. Stafford, E. M. Cowling and G. H. Gerpheide, Hawthorne Paper Company.

M. S. Fogerty, Paul deGuehery, G. C. Schmidt, W. H. Astle, R. L. Barton and Robert Von Maur, Michigan Paper Company.

C. E. Hellenberg and J. G. Callan, Jr., Foxboro Company.

Ralph Atkins, Arthur Weinland and H. S. Johnston, Lee Paper Company.

Harrison Starr, Price & Pierce Ltd.

J. R. Verdon and W. S. Taylor, American Cyanamid and Chemical Corp.

V. L. Shaw, Perfecting Service Corp.

O. W. Callighan, Edgar Brothers.

H. C. Pearson, Pioneer Paper Company

# Imports of Paper and Paper Stock

**Giving Manifests of New York, Boston, Philadelphia and Other Ports, of Newsprint, Wrapping, Writing, Coated, Blotting, Tissue, Strawboard, Wallboard, Cigarette Papers, Sulphite, Kraft and Ground Wood Pulp.**

## NEW YORK IMPORTS

WEEK ENDING DECEMBER 18, 1937

SUMMARY

Cigarette paper .....43 cs.
Wall paper .....142 bls., 24 cs., 41 bxs.
Wall board .....2,865 bdls.
Newsprint .....7,834 rolls
Printing paper .....12 cs.
Wrapping paper .....47 bls., 5 cs.
Drawing paper .....6 cs.
Filter paper .....15 cs.
Photo paper ..... 1 cs. (unsensitized)
Coated paper .....6 cs.
Decalcomania paper .....26 cs. (duplex)
Decalcomanias .....16 cs.
Marble paper .....4 cs.
Bowl paper .....7 bls.
Gummed paper .....7 cs.
Cellophane paper .....5 cs.
Wood pulp paper .....15 bls.
Miscellaneous paper ..... 301 rolls, 319 bls., 210 cs.

CIGARETTE PAPER

Braunstein Freres, Inc., *Queen Mary*, Southampton, 41 cs.
De Manduit Paper Corp., Maricot Havre, 2 cs.

WALL PAPER

American Express Co., *Washington*, Havre, 19 bls.
———, *Europa*, Bremen, 5 bls., 12 cs.
F. J. Emmerich Co., *Europa*, Bremen, 2 bls.
———, *Ascania*, Havre, 6 bls.
———, *Ascania*, London, 5 cs. 11 bls
W. J. Byrnes Co., *Ilsenstein*, Antwerp, 1 ble.
J. E. Bernard Co., *Ilsenstein*, Antwerp, 98 bls., 7 cs. (unprinted).
S. K. Lonegren, *Kungsholm*, Gothenburg, 41 bxs.

WALL BOARD

Treetex Corp., *Sagoporack*, Horneborg, 2865 bdls.

NEWSPRINT

Jay Madden Corp., *Scanyork*, Wiborg, 619 rolls.
N. Y. Evening Journal, *Ragnhildsholm*, Norrkoping, 248 rolls.
Jay Madden Corp., *Washington*, Hamburg, 306 rolls.
N. Y. Evening Journal, *Markland*, Liverpool, N. S. 649 rolls.
N. Y. Tribune, *Markland*, Liverpool, N. S., 2006 rolls.
World Telegram, *Markland*, Liverpool, N. S., 599 rolls.
Brooklyn Daily Eagle, *Markland*, Liverpool, N. S., 108 rolls.
Westchester Newspapers, Inc., *Markland*, Liverpool, N. S., 140 rolls.
N. Y. Post, *Markland*, Liverpool, N. S., 670 rolls.
W. H. Bell, *Markland*, Liverpool, N. S., 87 rolls.
Sharp Paper & Specialty Co., *Markland*, Liverpool, N. S., 680 rolls.
Parsons & Whittemore, Inc., *Markland*, Liverpool, N. S., 609 rolls.
Jay Madden Corp., *American Traveler*, Hamburg, 505 rolls.
Perkin Goodwin & Co., *American Traveler*, Hamburg, 250 rolls.
N. Y. Evening Journal, *American Traveler*, Hamburg, 358 rolls.

PRINTING PAPER

E. Dietzgen & Co., *Ingria*, Marseilles, 9 cs.
Ozalid Corp., *Europa*, Bremen, 3 cs.

WRAPPING PAPER

M. M. Cohen, *Washington*, Hamburg, 12 bls.
Keller Dorian Paper Co., *Queen Mary*, Southampton, 2 cs.
Keller Dorian Paper Co., *Pr. Monroe*, Marseilles, 3 cs. 1 ble.
Majestic Paper & Twine Co., Inc., *Kungsholm*, Gothenburg, 20 bls.
Lunham & Reeve, Inc., *Kungsholm*, Gothenburg, 14 bls.

DRAWING PAPER

Morilla Co., *Ingria*, Marseilles, 3 cs.
Favor Ruhl & Co., *Washington*, Havre, 2 cs.
Keuffel & Esser Co., *Ascania*, London, 1 cs.

FILTER PAPER

E. H. Sargent & Co., *Ragnhildsholm*, Gothenburg, 7 cs.
H. Reeve Angel & Co., Inc., *Ascania*, London, 8 cs.

PHOTO PAPER

J. J. Gavin & Co., *Queen Mary*, Southampton, 1 cs. (unsensitized)

COATED PAPER

W. J. Byrnes Co., *Queen Mary*, Southampton, 6 cs.

DECALCOMANIA PAPER

B. F. Drakenfeld & Co., *Laconia*, Liverpool, 26 cs. (duplex).

DECALCOMANIAS

Sellers Transportation Co., *Europa*, Bremen, 4 cs.
———, *Europa*, Bremen, 12 cs.

MARBLE PAPER

Borden Riley Paper Co., *Ilsenstein*, Antwerp, 4 cs.

BOWL PAPER

Hurley Johnson Corp., *Laconia*, Liverpool, 7 bls.

GUMMED PAPER

Heemsoth Basse & Co., *Europa*, Bremen, 7 cs.

CELLOPHANE PAPER

T. Cook & Son, *Conti di Savoia*, Genoa, 5 cs.

WOOD PULP PAPER

A. Giese & Son, *Black Eagle*, Rotterdam, 15 bls.

MISCELLANEOUS PAPER

Japan Paper Co., *Peter Maersk*, Kobe, 136 cs.
Columbia Ribbon & Carbon Manfg. Co., *Pr. Monroe*, Genoa, 11 cs.
Columbia Ribbon & Carbon Manfg. Co., *Birmania*, Genoa, 63 cs.
The Borregaard Co., Inc., *Kungsholm*, Gothenburg, 15 bls., 301 rolls.
F. L. Kramer & Co., *Europa*, Gothenburg, 304 bls.

RAGS, BAGGINGS, ETC.

J. Herber, *Siboney*, Havana, 50 bls. rags.
Loumar Textile By Products, *Collamer*, Havre, 51 bls., bagging.
Chase National Bank, *Collamer*, Bordeaux, 20 bls. rags.
Chase National Bank, *Kalinin*, Leningrad, 2587 bls. rags.
Banco Coml Italiane Trust Co., *Kalinin*, Leningrad, 912 bls. flax waste.
E. J. Keller Co., Inc., *Kunikawa Maru*, ———, 500 bls. cotton waste.
Hoffman Lion Mills, *Kunikawa Maru*, Kobe, 135 bls. rags.
American Waste Co., *Kunikawa Maru*, Kobe, 60 bls. rags.
Bank of N. Y. Trust Co., *City of Sydney*, Bombay, 80 bls. rags.
Chase National Bank, *City of Sydney*, Bombay, 48 bls. rags.
Chase National Bank, *American Importer*, Manchester, 94 bls. bagging.
E. Butterworth & Co. Inc., *American Importer*, Manchester, 64 bls. old twine.
———, *American Importer*, Manchester, 59 bls. rags, 13 bls. paper stock.
M. Snedeker Corp., *American Importer*, Belfast, 97 bls. paper stock.
Castle & Overton, Inc., *American Traveler*, Hamburg, 124 bls. bagging.
J. Cohen & Son Co. Inc., *Laconia*, Liverpool, 16 bls. paper stock.
Manufacturers Trust Co., *Laconia*, Liverpool, 14 bls. rags.
———, *Birmania*, Trieste, 278 bls. rags, 164 bls. bagging.
National City Bank, *Nagara Maru*, Kobe, 70 bls. thread waste.
E. J. Keller Co. Inc., *Pipestone County*, ———, 164 bls. bagging.
Manufacturers Trust Co., *Pipestone County*, Dunkirk, 17 bls. rags.

Van Oppen & Co., *Pipestone County*, Havre, 66 bls. bagging.
J. T. Flannery, *Pipestone County*, Havre, 54 bls. rags.
E. J. Keller Co. Inc., *Pr. Monroe*, ——, 104 bls. paper stock.

OLD ROPE

W. Steck & Co., *Helvig*, London, 175 coils.
Banco Coml Italiane Trust Co., *Helvig*, London, 58 bls.

CASEIN

——, *Maricot*, Havre, 200 bags.

WOOD PULP

Perkins Goodwin & Co., *Ragnhildsholm*, Gothenburg, 150 bls. sulphite, 140 bls. sulphate.
M. Sone, *Ragnhildsholm*, Gothenburg, 254 bls. wood pulp.
Bankers Trust Co., *Ragnhildsholm*, Gothenburg, 140 bls. sulphate.
Price & Pierce, Ltd., *Ragnhildsholm*, Gothenburg, 325 bls. sulphite.
Lagerloef Trading Co., *Scanyork*, Helsingfors, 260 bls., mechanically ground, 52 tons.
——, *Birmania*, Trieste, 500 bls. woodpulp.
Pagel Horton & Co. Inc., *Sagoporack*, Gefle, 1665 bls. sulphate, 338 tons.
Pagel Horton & Co. Inc., *Sagoporack*, Gefle, 375 bls. sulphite 75 tons.
——, *Sagoporack*, Sandarne, 750 bls. sulphate, 150 tons.
——, *Sagoporack*, Horneborg, 900 bls. chemical pulp 152 tons.
Mead Sales Co. Inc., *Sagoporack*, Sundsvall, 210 bls. chemical pulp, 42 tons.
Johaneson Wales & Sparre, Inc., *Sagoporack*, Sundsvall, 200 bls. chemical pulp, 40 tons.
Johaneson Wales & Sparre, Inc., *Sagoporack*, Sundsvall, 1925 bls. sulphite, 375 tons.
Johaneson Wales & Sparre, Inc., *Sagoporack*, Sundsvall, 120 bls. knotter pulp, 20 tons.
Johaneson Wales & Sparre, Inc., *Sagoporack*, Sundsvall, 150 bls. kraft sulphate, 25 tons.

WOOD PULP BOARDS

——, *Ragnhildsholm*, Viipuri, 127 rolls.
Wilkinson Bros. & Co. Inc., *Ragnhildsholm*, Gothenburg, 16 rolls.
A. Johnson & Co., *Ragnhildsholm*, Gothenburg, 47 bdls.
Miller Paper Co., *Ragnhildsholm*, Gothenburg, 49 bls.
H. Fuchs & Son, *Ragnhildsholm*, Gothenburg, 18 crates.
Jay Madden Corp., *Scanyork*, Wiborg, 76 rolls, 266 bls. 63 tons.
Flexideal Dry Mat Co., *Washington*, Hamburg, 120 cases.
H. Fuchs & Son, *Kungsholm*, Gothenburg, 25 crates.

WOOD PULP SHEETS

C. Bishop & Co., *Washington*, Hamburg, 50 bls.

## BOSTON IMPORTS

WEEK ENDING DECEMBER 18, 1937

Castle & Overton, Inc., *Ragnhildsholm*, Viipuri, 5031 bls. wood pulp.
Lagerloef Trading Co., *Ragnhildsholm*, Viipuri, 1200 bls. sulphite, 2805 bls. sulphate.
Lagerloef Trading Co., *Ragnhildsholm*, Kotka, 2060 bls. sulphate, 448 bls. sulphite.
Jay Madden Corp., *Ragnhildsholm*, Kotka, 279 rolls newsprint.
——, *Ragnhildsholm*, Kotka, 260 rolls newsprint.
New England Newspaper Publishing Co., *Ragnhildsholm*, Kotka, 126 rolls newsprint.
Jay Madden Corp., *Ragnhildsholm*, Viipuri, 114 bls. wood pulp boards.
——, *Ragnhildsholm*, Norrkoping, 89 bls. wrapping paper.
——, *Ragnhildsholm*, Gothenburg, 12 bls. wrapping paper.
U. S. Travelware Corp., *Ragnhildsholm*, Gothenburg, 4 bls. wood pulp boards.
Castle & Overton, Inc., *Black Eagle*, Rotterdam, 460 bls. wood pulp, 92 tons.
International Purchasing Co., *Black Eagle*, Antwerp, 59 coils old rope.
M. Sone, *Birmania*, Trieste, 450 bls. wood pulp.
——, *Birmania*, Trieste, 666 bls. wood pulp.
Royal Manfg. Co., *Pipestone County*, Havre, 77 bls. rags.
Gottesman & Co. Inc., *Norefjord*, Sweden, 1500 bls. sulphite.
Pagel Horton & Co. Inc., *Norefjord*, Sweden, 558 bls. wood pulp.

## NEW LONDON IMPORTS

WEEK ENDING DECEMBER 18, 1937

Pagel Horton & Co. Inc., Sagoporack, Sweden, 500 bls. wood pulp.

## PHILADELPHIA IMPORTS

WEEK ENDING DECEMBER 18, 1937

N. Schwab & Sons, *Collamer*, Havre, 38 bls. old strings.
Castle & Overton, Inc., *Collamer*, Havre, 114 bls. rags.
E. J. Keller C. Inc., *Collamer*, ——, 248 bls. rags.
——, *Birmania*, Trieste, 499 bls. wood pulp.
Gottesman & Co. Inc., *Gonzenheim*, Sweden, 1750 bls. sulphite, 500 bls. sulphate.

## WILMINGTON IMPORTS

WEEK ENDING DECEMBER 18, 1937

Pagel Horton & Co. Inc., *Gonzenheim*, Sweden, 3000 bls. wood pulp.

## BALTIMORE IMPORTS

WEEK ENDING DECEMBER 18, 1937

Congoleum Nairn Co., *Collamer*, Havre, 2515 bls. rags.
Congoleum Nairn Co., *Collamer*, Bordeaux, 426 bls. rags.
Washington Post, *Markland*, Liverpool, N. S., 1213 rolls newsprint.
M. Sone, *City of Norfolk*, Hamburg, 566 bls. wood pulp.
M. Sone, *London Exchange*, Rotterdam, 2580 bls. wood pulp.

## HOUSTON IMPORTS

WEEK ENDING DECEMBER 18, 1937

Loumar Textile By Products, *Kunikawa Maru*, Kobe, 120 bls. bagging.

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## Northern Transfers Power Plants

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., December 20, 1937.—Northern Paper Mills, Green Bay, Wis., officially transferred operation of its two hydro-electric plants near Amberg, Wis., on the Menominee River, Friday, December 17, to the Wisconsin Michigan Power Company. On that date the contract for purchase at a price of $2,350,000 went into effect, in view of the approval of the sale by the Federal Power Commission, the Wisconsin Public Service Commission and the Michigan Public Utility Commission. Accompanying sanction of the sale was the approval of the sale of $2,000,000 in 3¾ per cent bonds and issuance of $700,000 in notes to finance the deal and provides additional working capital.

Each of the plants is equipped with three turbo generator units. The Chalk Hill plant has an installed generating capacity of 9,750 kilovolt amperes and an operating head of 28 feet. The White Rapids plant has an installed generating capacity of 10,000 kilovolt amperes and an operating head of 29 feet.

Both plants are equipped with semi-automatic switchboards having equipment installed for protection against electrical and mechanical troubles. Dams are of the conventional gravity type with tainter gates controlled by electric hoisting machinery. The plants are eleven years old.

Included in the deal is a 132,000-volt transmission line extending for 60 miles on steel towers, and three miles of 13,200-volt wood lines and incidental step-up and step-down substations, connecting to the Northern Paper Mills at Green Bay. No direct service will be given the Northern mills, formerly supplied by the White Rapids plant, but power will be supplied by Wisconsin Public Service Corporation, which has interconnection with Wisconsin Michigan Power Company. The entire output of the Chalk Hill plant has been purchased by the new owners for the last ten years under contract.

# J. Andersen & Co.

*Selling Agents*

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## CHEMICAL & MECHANICAL PULP

**Kraft Pulp**

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Söderhamn, Sweden
KALIX TRÄINDUSTRI AKTIEBOLAG
Vanaförden, Sweden
MUNKSUNDS AKTIEBOLAG
Munksund, Sweden
NENSJÖ CELLULOSA A.-B.
Sprängsviken, Sweden

**Unbleached Sulphite**

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Greaker, Norway
BERGVIK OCH ALA NYA AKTIEBOLAG
Söderhamn, Sweden
CELLULOSEFABRIKS A.-G.
Bratislava, Czecho-Slovakia
SVANÖ AKTIEBOLAG
Svanö, Sweden

**Bleached Sulphite**

KELLNER-PARTINGTON PAPER PULP CO., LTD.
Sarpsborg, Norway
Edsvalla, Sweden
Hallein & Villach, Austria

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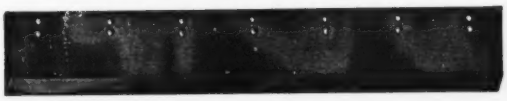

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EXCELSIOR
Knox Woolen Co.
Camden, Me.
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## HIGH POROSITY

. . . as a characteristic of a paper maker's felt will, not only add to the life of felt, but saves time lost on the machine due to excessive shut downs for washing. Specify

## EXCELSIOR FELTS

and minimize this trouble. Made by the Knox Woolen Co., of Camden, Maine, since 1864.

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## New York Market Review

OFFICE OF THE PAPER TRADE JOURNAL
Wednesday, December 22, 1937.

Trading in the wholesale paper market during the current week is reported as very quiet. The demand for nearly all grades of paper continues very light, with the exception of the holiday market for tissues which is reported as slightly improved this week as a result of last-minute orders. Prices are firm and unchanged, with relatively few instances reported of cutting from prevailing market prices.

Aside from a comparatively small volume of hand-to-mouth sales, no substantial activity is expected this year. Supplies of the paper merchants have dwindled to such a low point, that they are expected to stock up early next year.

The newsprint market is active, with contract shipments moving in normal volume.

The demand for kraft paper is reported as less than last week, with little improvement expected for the remainder of the month. Consumer demand is now at so low a level that current production is reported at approximately 50 per cent of capacity. The opinion is generally held in the trade that jobbers' stocks are now so depleted that any improvement in demand must be reflected in the wholesale market at a comparatively early date. A gradual improvement in the wholesale kraft paper market after the Holidays is expected, but activity comparable to last year is not now looked for until after the first quarter of 1938. The trade, however, is more optimistic than for some weeks past regarding prospects for the future.

The writing paper market is quiet, with prices firm. The tissue market showed a temporary increase in activity, due to late Christmas business.

The demand for box board is reported as quiet, with prices steady and unchanged.

The demand for book and lithographic papers continues on about the level of the preceding week.

### Chemical Pulp

The trend in demand in the chemical pulp market is reported as continuing downward. Prices are firm and unchanged from last week's quotations, with the expectation of some reduction if demand does not materially improve before long.

### Mechanical Pulp

The demand for mechanical pulp is relatively light. Prices remain firm and are on about the level of the preceding week.

### Old Rope and Bagging

Trading in the old rope market is quiet. Prices continue at about the same level as the previous week. The demand for bagging is reported as light. Prices are unchanged, with the exception of the Gunny No. 1 grades which are reported as slightly lower.

### Rags

The demand in the domestic rag market is reported as extremely spotty. Prices are unchanged from last week's listings. The foreign rag market is reported as holding up better, on account of the home demand. Prices are thus nominal.

### Waste Paper

The waste paper market is quiet, with the exception of the foreign grades which are more active. Prices remain unchanged.

### Twine

The twine market is quiet. Prices continue at the level of the preceding week.

## C. J. Moynihan Elected President

[FROM OUR REGULAR CORRESPONDENT]

GLENS FALLS, N. Y., December 13, 1937.—A meeting of Hudson River Local, 20, Pulp, Sulphite and Paper Mill Workers was held this week in the recreation rooms of Finch, Pruyn & Co. at which C. J. Moynihan was elected president for the next year. Other officers chosen included Harris Hopkins, vice president; Percy J. Hovey, secretary-treasurer; Gerald Hopkins, financial secretary; Thomas Pearsons, Morris O'Connor and C. D. Blake, trustees; Herbert Briggs and John Edwards guards.

## Midvale Paper Board Co. Expands

HUDSON, N. Y., December 8, 1937—The Midvale Paper Board Company has completed an addition to the Rossman plant which will add to convenience and tend to increase production. A new packing room and a shipping room have been erected and new paper driers have been placed. The office has been enlarged and all additions are of brick and steel construction. The improvements add greatly to the appearance of the plant and are in line with the company's plan of expansion.

## Renews Paper Making Patent

American Lakes Paper Company, owner of Seaborne Patent No. 1,517,018, Paper Making Machine, 43 East Ohio Street, Chicago, advise that this patent has been reissued. The amended patent, which takes effect on December 28, 1937, covers the Seaborne rubber marking roll equipment which has been extensively used by American Lakes Paper Company and Thilmany Pulp and Paper Company since the year 1923 in connection with the manufacture of stripe marked and design marked wrapping papers.

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Appleton Woolen Mills, Appleton, Wisconsin

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| PAPERMAKING MATERIALS | $3.00 |
| CHEMISTRY OF THE SULPHITE PROCESS | 3.00 |
| BIBLIOGRAPHY OF PAPERMAKING, Vol. I | 10.00 |
| BIBLIOGRAPHY OF PAPERMAKING, Vol. II | 8.00 |

LOCKWOOD TRADE JOURNAL CO., Inc.
15 W. 47th St., N. Y. C.

# Miscellaneous Markets

OFFICE OF THE PAPER TRADE JOURNAL
Wednesday, December 22, 1937.

BLANC FIXE—The demand for blanc fixe is reported as steady. Prices continue at formerly quoted levels. The pulp is quoted at from $42.50 to $45 per ton, in bulk; the powder at from 3½ to 3¾ cents per pound, in barrels, at works.

BLEACHING POWDER—The bleaching powder market is steady. Prices are firm and conform with the quotations of the previous week. Bleaching powder is offered at $2 to $2.25 per 100 pounds, in drums, at works.

CASEIN—The demand for casein is unchanged for the current week. Prices are unchanged. Domestic standard ground casein is quoted at from 12 to 12½ cents per pound; domestic finely ground casein at 13 cents per pound; all in bags, car lot quantities.

CAUSTIC SODA—The caustic soda market continues at about the level of last week. Prices are firm. Solid caustic soda is quoted at from $2.10 to $2.30 per 100 pounds; flake and ground at from $2.50 to $2.70 per 100 pounds, in drums, at works.

CHINA CLAY—The demand for china clay is reported as steady. Prices are unchanged. Imported clay is quoted at from $14.50 to $25 per ton, ship side. Domestic filler clay is offered at from $6.50 to $12 per ton; coating clay at from $11 to $22 per ton, at mines.

CHLORINE—The chlorine market continues steady, with prices unchanged from the quotations of the preceding week. Chlorine is quoted at $2.15 per 100 pounds, in single-unit tank cars, f.o.b., at works.

ROSIN—The demand for rosin is reported as steady. Prices are slightly lower for the current week. Paper making rosin is quoted at $5.10; wood rosin at $5.00 per 280 pounds, gross weight, in barrels at Savannah. Seventy per cent rosin size is quoted at $2.78 per 100 pounds, in tank cars, f.o.b., shipping point.

SALT CAKE—The salt cake market continues steady. Little or no domestic salt cake is available. Quotations range from $12 to $13.50 per ton; chrome salt cake from $11 to $12, f.o.b., shipping point. Imported salt cake is offered at from $14.50 to $15 per ton, Gulf or Atlantic Seaboard, on dock.

SODA ASH—The demand for soda ash remains steady. Prices continue firm. Quotations on soda ash, in car lots, at works, per 100 pounds, are as follows: in bulk, $.90; in bags, $1.05; and in barrels, $1.35.

STARCH—The starch market continues on about the level of the preceding week. Prices are firm. Globe pearl is offered at $2.60 per 100 pounds, in bags, and at $2.85 in barrels. Special paper starch is quoted at $2.70 per 100 pounds, in bags, and at $2.95 in barrels; all prices in car lots, f.o.b., Chicago.

SULPHATE OF ALUMINA—The demand for sulphate of alumina is steady. Prices are firm and comply with the quotations of the previous week. The commercial grades are quoted at from $1.25 to $1.60; iron free at from $2 to $2.25 per 100 pounds, in barrels, at works.

SULPHUR—The sulphur market continues steady. Prices are unchanged from last week's quotations. Annual contracts are quoted at $18 per long ton, f.o.b., cars at mines. Spot and nearby car lots are offered at $21 per ton.

TALC—Trading in the talc market is reported as moderately active. Prices remain unchanged. Domestic talc is quoted at from $15 to $18 per ton, Eastern mines. Imported talc is offered at from $25 to $40 per ton, on dock.

# Market Quotations

## Paper

(Delivered New York)

News, per ton—
Roll, contract.....42.50 @ —
Sheets .....47.50 @ —

Boards, per ton—
News .....35.00 @37.50
Chip .....35.00 @37.50
Sgl. Mla. Ll. Chip.52.50 @ —
Jute Lined Chip...52.50 @ —
White Pat. Coated.65.00 @ —
Kraft Liners .....55.00 @ —
Binders Boards....75.00 @80.00

The following are representative of distributors' resale prices:—

Rag Content Bonds and Ledgers—
White, Assorted Items,
Delivered in Zone 1:

| | Bonds | Ledgers |
|---|---|---|
| 100% Rag Ext. | | |
| No. 1. | $41.40@$48.50 | $42.55@$50.00 |
| 100% Rag | 32.80@ 38.50 | 33.95@ 39.75 |
| 85% Rag | ..... | 32.20@ 37.75 |
| 75% Rag | 24.75@ 29.00 | 25.90@ 30.50 |
| 65% Rag | 21.65@ 26.25 | 22.80@ 27.75 |
| 50% Rag | 18.70@ 22.75 | 19.90@ 24.25 |
| 25% Rag | 15.80@ 19.25 | 16.95@ 20.75 |

Regular Colors @ $1.50 cwt. extra.
Heavy Colors @ $3.00 cwt. extra

Sulphite Bonds and Ledgers—
White, Assorted Items,
Delivered in Zone 1:

| | Bonds | Ledgers |
|---|---|---|
| No. 1. | $9.35@$11.50 | $10.55@$12.75 |
| No. 2. | 8.50@ 10.25 | 9.65@ 11.75 |
| No. 4. | 7.60@ 9.25 | 8.80@ 10.75 |

Regular Colors @ $1.50 cwt. extra.
Heavy Colors @ $3.00 cwt. extra.

Free Sheet Book Papers—
White, Cased Paper,
Delivered in Zone 1:

| | |
|---|---|
| No. 1 Glossy Coated | $12.15@$14.25 |
| No. 2 Glossy Coated | 10.55@ 12.25 |
| No. 3 Glossy Coated | 9.35@ 11.00 |
| No. 4 Glossy Coated | 8.80@ 10.50 |
| No. 1 Antique (watermarked) | 8.80@ 10.50 |
| No. 2 Offset | 8.05@ 9.50 |
| A Grade E. F. | 7.90@ 9.50 |
| A Grade S. & S. C. | 8.15@ 9.75 |
| B Grade E. F. | 7.30@ 8.75 |
| B Grade S. & S. C. | 7.55@ 9.00 |
| C Grade E. F. | 7.00@ 8.50 |
| C Grade S. & S. C. | 7.25@ 8.75 |
| D Grade E. F. | 6.75@ 8.25 |
| D Grade S. & S. C. | 7.00@ 8.50 |

Ivory & India at $.50 cwt. extra.

Kraft—per cwt.
Standard Northern.$5.75 @$7.40
Standard Southern. 5.50 @ 7.10

Sulphite, per cwt.
50 lb. Steam Finish$4.75 @$5.85

Paper Towels, per case
32 lb. Junior, unbleached .....$2.65 @$3.35
32 lb. Senior, unbleached ..... 3.20 @ 3.90

Wrapping Tissue, 24x36—480, per ream
No. 1 White.....$1.10 @$1.50
No. 1½ White.... 1.00 @ 1.40
No. 2 White..... .70 @ 1.00
Manila ..... .70 @ 1.00

## Mechanical Pulp

(On Dock, Atlantic Ports)

No. 1 Imported—
Moist .....35.00 @36.00
Dry .....40.00 @42.00

(Delivered)

No. 1 Domestic and Canadian .....36.00 @37.50

## Chemical Pulp

(On Dock, Atlantic, Gulf and West Coast Ports)

Bleached Sulphite (Domestic and Foreign)—
Prime Bleached Sulphite ..... 3.50 @ 4.63
Prime Qualities—
Easy-Bleaching Sulphite ..... 3.00 @ 3.75
Strong Unbleached Sulphite ..... 2.50 @ 3.50

(On Dock, Atlantic Ports)

Kraft Bleached..... 4.00 @ 4.50
Kraft Light & Strong 3.00 @ 3.75
Kraft No. 1..... 2.50 @ 3.25
Kraft No. 2..... 2.25 @ 2.50

(F.o.b. Pulp Mill)

Kraft Domestic..... 2.00 @ 2.50

(Delivered)

Soda Bleached..... 3.25 @ —

Add 60 cents per short ton, dock charges for Albany; $2.50 for Lake Ports East and $3.50 for Lake Ports West of Mackinac Straits.

## Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—
New White, No. 1 7.00 @ 7.25
Silesias, No. 1.... 5.25 @ 5.75
New Unbleached... 7.50 @ 8.00
Blue Overall..... 6.25 @ 6.50
Fancy ..... 2.75 @ 3.00
Washables ..... 2.25 @ 2.50
Mixed Khaki Cuttings ..... 3.75 @ 4.00
O. D. Khaki Cuttings 4.25 @ 4.35

Old Rags

White, No. 1—
Repacked ..... 3.50 @ 3.60
Miscellaneous ..... 2.75 @ 3.00
White, No. 2—
Repacked ..... 2.25 @ 2.50
Miscellaneous ..... 2.00 @ 2.25
Thirds and Blues—
Repacked ..... 1.50 @ 1.75
Miscellaneous .... 1.25 @ 1.50
Roofing Rags—
No. 1..... 1.30 @ 1.40
No. 2..... .75 @ .80
No. 3 (bagging).. .70 @ .80
No. 4..... .70 @ .80
No. 5A..... .65 @ .70

## Foreign Rags

New Rags

New Dark Cuttings.. 2.25 @ 2.40
New Mixed Cuttings. 2.00 @ 2.20
New Light Silesias.. 5.50 @ 5.75
Light Flannelettes... 5.50 @ 5.75
New White Cuttings. 7.00 @ 7.50
New Light Oxford.. 4.00 @ 4.50
New Light Prints... 3.00 @ 3.25

Old Rags

No. 1 White Linens. 7.50 @ 8.50
No. 2 White Linens. 6.50 @ 7.50
No. 3 White Linens. 4.50 @ 5.50

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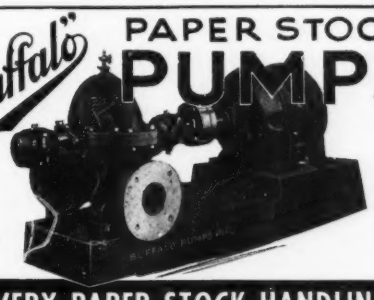

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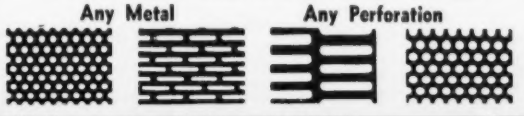

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|---|---|---|---|
| No. 4 White Linens. | 2.25 | @ | 3.25 |
| No. 1 White Cotton. | 4.25 | @ | 4.75 |
| No. 2 White Cotton. | 3.25 | @ | 3.75 |
| No. 3 White Cotton. | 2.50 | @ | 3.00 |
| No. 4 White Cotton. | 1.90 | @ | 2.20 |
| Extra Light Prints.. | 2.00 | @ | 2.40 |
| Ord. Light Prints... | 1.75 | @ | 2.15 |
| Med. Light Prints... | 1.55 | @ | 1.95 |
| Dutch Blue Cottons.. | 2.25 | @ | 2.50 |
| French Blue Linens.. | 3.00 | @ | — |
| Checks and Blues... | 2.00 | @ | — |
| Linsey Garments.... | 2.00 | @ | 2.10 |
| Dark Cottons..... | 1.60 | @ | 1.70 |
| Old Shopperies..... | 1.45 | @ | — |
| New Shopperies..... | 1.45 | @ | — |
| French Blues..... | 2.25 | @ | 2.50 |

### Old Rope and Bagging

(Prices to Mill f. o. b. N. Y.)

| | | | |
|---|---|---|---|
| Gunny No. 1— | | | |
| Foreign ..... | 2.20 | @ | 2.25 |
| Domestic ..... | 2.00 | @ | 2.15 |
| Wool Tares, light.... | 1.50 | @ | 1.75 |
| Wool Tares, heavy.. | 2.00 | @ | 2.10 |
| Bright Bagging..... | 1.60 | @ | 1.70 |
| Manila Rope— | | | |
| Foreign ..... | 3.25 | @ | 3.50 |
| Domestic ..... | 3.50 | @ | 3.75 |
| Jute Threads..... | 2.75 | @ | 3.00 |
| Sisal Strings..... | 2.35 | @ | 2.45 |
| Mixed Strings..... | Nominal | | |

### Old Waste Papers

(F. o. b. New York)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| White Envelope Cuttings ..... | 2.50 | @ | 2.60 |
| Ordinary Hard White No. 1.... | 1.90 | @ | 2.00 |
| Soft White No. 1.. | 2.15 | @ | 2.25 |
| Flat Stock— | | | |
| Stitchless ..... | .75 | @ | .85 |
| Overissue Mag..... | .75 | @ | .85 |
| Solid Flat Book... | .55 | @ | .60 |
| Crumbled No. 1... | .40 | @ | .45 |
| Ledger Stock..... | 1.00 | @ | 1.10 |
| New B. B. Chips.... | .25 | @ | .30 |
| Manila— | | | |
| New Env. Cut.... | 1.85 | @ | 2.00 |
| New Cuttings..... | 1.50 | @ | 1.60 |
| Old Kraft Machine— | | | |
| Compressed bales.. | .70 | @ | .75 |
| News— | | | |
| No. 1 White News | 1.10 | @ | 1.20 |
| Strictly Overissue. | .45 | @ | .50 |
| Strictly Folded.... | .30 | @ | .35 |
| No. 1 Mixed Paper.. | .15 | @ | .20 |

### Twines

(F. o. b. Mill)

(Soft Fiber)

| | | | |
|---|---|---|---|
| Coarse Polished— | | | |
| India ..... | .15 | @ | .16½ |
| White Hemp..... | .16 | @ | .17½ |
| Fine Polished— | | | |
| Fine India..... | .20 | @ | .22 |
| Unpolished— | | | |
| Box ..... | .11 | @ | .11½ |
| Paper Makers..... | .11 | @ | .12¾ |
| Tube Rope ..... | .11½ | @ | .14¼ |
| Wall Paper ..... | .12½ | @ | .13¾ |
| Wrapping ..... | .14 | @ | .14½ |
| Soft Fiber Rope... | .13¾ | @ | .14¼ |
| Cotton ..... | .17 | @ | .21 |
| (Hard Fiber) | | | |
| Medium Java..... | .12 | @ | .12½ |
| Mex. Sisal..... | .11 | @ | .11½ |
| Manila ..... | .21 | @ | .28 |
| Domestic ..... | 3.00 | @ | 3.25 |
| Transmission Rope... | 1.75 | @ | 1.90 |
| Soft Jute Ropes..... | 1.90 | @ | 2.00 |
| Jute Carpet Threads. | 1.40 | @ | 1.60 |
| Gunny Bagging— | | | |
| Foreign ..... | 2.15 | @ | 2.25 |
| Domestic ..... | 1.80 | @ | 1.90 |
| Bleachery Burlap.... | 3.50 | @ | 4.00 |
| Scrap Burlap | | | |
| Foreign ..... | 1.80 | @ | 1.90 |
| Domestic ..... | 1.60 | @ | 1.80 |
| Scrap Sisal..... | 1.80 | @ | 2.00 |
| Scrap Sisal for Shredding ..... | 2.25 | @ | 2.65 |
| Wool Tares, Heavy.. | 2.00 | @ | 2.05 |
| New Burlap Cuttings | 2.00 | @ | 2.25 |
| Aust. wool pouches... | 3.00 | @ | 3.25 |
| Heavy baling bagging | 2.00 | @ | 2.15 |
| Paper Mill Bagging. | 1.50 | @ | 1.60 |
| Bagging No. 2..... | .85 | @ | 1.00 |

### Domestic Rags (New)

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New Light Prints. | .03 | @ | .03¼ |
| New White No. 1. | .07½ | @ | .07¾ |
| New White No. 2. | .05½ | @ | .05¾ |
| New Light Flannelettes ..... | — | @ | .06 |
| Silesias No. 1..... | .05½ | @ | .06 |
| New Black Silesias.. | .03¾ | @ | .04 |
| Silesias No. 1 | | | |
| Soft Unbleached..... | .07½ | @ | .08 |
| Blue Cheviot ..... | .06½ | @ | .06¾ |
| Fancy ..... | .03 | @ | .03¼ |
| Washable ..... | .02¾ | @ | .03 |
| Cottons—According to grades— | | | |
| Blue Overalls..... | .06½ | @ | .06¾ |
| New Black, soft... | .03¾ | @ | .04 |
| Khaki Cuttings..... | .03½ | @ | .04 |
| O. D. Khaki..... | .04 | @ | .04¼ |
| Corduroy ..... | .02¾ | @ | .03 |
| New Canvas..... | .07¼ | @ | .07½ |
| B. V. D. Cuttings. | .08¼ | @ | .08½ |

### Domestic Rags (Old)

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Canvas ..... | .04½ | @ | — |
| White No. 1— | | | |
| Repacked ..... | | @ | 2.75 |
| Miscellaneous ..... | 2.50 | @ | 2.75 |
| White No. 2— | | | |
| Repacked ..... | 1.90 | @ | 2.00 |
| Miscellaneous ..... | 2.00 | @ | 2.25 |
| Twos and Blues..... | 1.75 | @ | 2.00 |
| Third and Blues— | | | |
| Repacked ..... | 1.37½ | @ | 1.75 |
| Miscellaneous ..... | 1.25 | @ | 1.62½ |
| Black Stockings..... | 3.90 | @ | 4.00 |
| Roofing Stock— | | | |
| No. 1..... | 1.00 | @ | 1.10 |
| No. 2..... | .75 | @ | .85 |
| No. 3..... | .65 | @ | .70 |

### Foreign Rags

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Dark Cottons..... | 1.30 | @ | 1.40 |
| Dutch Blues..... | 2.85 | @ | 3.00 |
| New Checks and Blues | 2.85 | @ | 3.00 |
| Old Fustians..... | 2.50 | @ | 2.60 |
| Old Linsey Garments | 1.90 | @ | 2.00 |
| New Silesias..... | 6.00 | @ | 6.50 |

## PHILADELPHIA

### Domestic Rags (New)

(Price to Mill, f. o. b. Phila.)

| | | | |
|---|---|---|---|
| Shirt Cuttings— | | | |
| New White, No. 1. | .07 | @ | .07½ |
| New White, No. 2. | .04½ | @ | .05 |
| Light Silesias..... | .05½ | @ | — |
| Silesias, No. 1.... | — | @ | .05½ |
| Black Silesias, soft. | .03 | @ | .03½ |
| New Unbleached.. | .07 | @ | .07½ |
| Washable, No. 1.. | .02 | @ | .02¾ |
| Blue Overall..... | .04 | @ | .04½ |
| Cottons—According to grades— | | | |
| Washable, No. 2.. | .01½ | @ | .01¾ |
| New Blue..... | .01¼ | @ | .01½ |
| Fancy Percales.... | — | @ | .03½ |
| New Black Soft... | .03 | @ | .03½ |
| New Light Seconds | — | @ | .05½ |
| New Dark Seconds | 1.00 | @ | 1.25 |
| Khaki Cuttings— | | | |
| No. 1 O. D..... | .03½ | @ | .04 |
| No. 2 Mixed..... | — | @ | .03¾ |
| Corduroy ..... | .02½ | @ | .03 |
| New Canvas..... | .06 | @ | .06½ |
| New Black Mixed. | .02 | @ | .02¾ |

### Domestic Rags (Old)

| | | | |
|---|---|---|---|
| White No. 1— | | | |
| Repacked ..... | 3.00 | @ | 3.25 |
| Miscellaneous .... | 2.75 | @ | 3.00 |
| Twos and Blues— | | | |
| Miscellaneous .... | 1.25 | @ | 1.50 |
| Repacked ..... | 1.50 | @ | 1.75 |
| Black Stockings (Export) ..... | 3.00 | @ | 3.50 |
| Roofing Stock— | | | |
| Foreign No. 1.... | — | @ | 1.25 |
| Domestic No. 1... | — | @ | 1.25 |
| Domestic No. 2... | 1.00 | @ | 1.10 |
| Roofing Bagging.. | .80 | @ | .90 |

### Bagging

(F. o. b. Phila.)

| | | | |
|---|---|---|---|
| Gunny, No. 1— | | | |
| Foreign ..... | 1.75 | @ | — |
| Domestic ..... | 1.70 | @ | 1.75 |
| Manila Rope..... | 3.00 | @ | 3.25 |
| Sisal Rope..... | 2.00 | @ | 2.25 |
| Mixed Rope ..... | 1.00 | @ | 1.10 |
| Scrap— | | | |
| No. 1..... | 1.50 | @ | — |
| No. 2..... | 1.00 | @ | 1.25 |
| Wool Tares, heavy.. | 3.25 | @ | 3.50 |
| Mixed Strings..... | 1.00 | @ | 1.10 |
| No. 1 New Light Burlap ..... | 3.00 | @ | 3.50 |
| New Burlap Cuttings | 2.00 | @ | 2.25 |

### Old Papers

(F. o. b. Phila.)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 Hard White. | 2.35 | @ | 2.40 |
| No. 2 Hard White. | 2.00 | @ | 2.10 |
| No. 1 Soft White.. | 2.00 | @ | 2.10 |
| No. 2 Soft White.. | 1.40 | @ | 1.50 |
| No. 1 Mixed..... | .70 | @ | .75 |
| Solid Ledger Stock.. | 1.50 | @ | 1.60 |
| Ledger Stock, white. | 1.25 | @ | 1.30 |
| Ledger Stock, colored | .85 | @ | .90 |
| No. 1 Books, heavy.. | .85 | @ | .90 |
| Manila Cuttings..... | 1.50 | @ | 1.75 |
| Print Manila..... | .45 | @ | .50 |
| Container Manila.... | — | @ | .40 |
| Kraft Paper..... | .90 | @ | .95 |
| No. 1 Mixed Paper.. | .25 | @ | .30 |
| Straw Board Chip... | .25 | @ | .30 |
| Binders Board Chip. | .25 | @ | .30 |
| Corrugated Board... | .50 | @ | .55 |
| Overissue News..... | .55 | @ | .60 |
| Old Newspapers .... | .30 | @ | .35 |

## BOSTON

### Old Papers

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 Hard White. | 2.25 | @ | 2.40 |
| No. 1 Soft White.. | 1.85 | @ | 2.15 |
| No. 2 Mixed..... | .75 | @ | .80 |
| Solid Ledger Books.. | 1.50 | @ | 1.75 |
| Overissue Ledger Stock ..... | 1.30 | @ | 1.50 |
| Mixed Ledgers..... | .85 | @ | .90 |
| No. 1 Books, heavy.. | .70 | @ | .80 |
| No. 1 Books, light... | .65 | @ | .75 |
| Crumpled Stitchless Book Stock ..... | .50 | @ | .60 |
| Manila Env. Cuttings | 1.60 | @ | 1.70 |
| Manila Envelope Cuttings, extra quality | 2.00 | @ | 2.15 |
| No. 1 Old Manila.... | .85 | @ | .95 |
| White Blank News.. | 1.30 | @ | 1.40 |
| No. 1 Kraft..... | .90 | @ | 1.00 |
| Mixed Papers ..... | .10 | @ | .15 |
| Print Manila..... | .45 | @ | .50 |
| Container Manilas... | .27½ | @ | — |
| Old Newspapers..... | .20 | @ | .25 |
| Paper Wool Strings. | — | @ | .60 |
| Overissue News..... | .45 | @ | .50 |
| Box Board Chips.... | .35 | @ | .40 |
| Corrugated Boxes... | .25 | @ | .27½ |
| Kraft corrugated boxes | .55 | @ | .65 |
| Screenings wrappers. | .45 | @ | .50 |

### Bagging

(F. o. b. Boston)

| | | | |
|---|---|---|---|
| Manila Rope— | | | |
| Foreign ..... | 2.50 | @ | 3.00 |

## CHICAGO

### Old Papers

(F. o. b. Chicago)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| No. 1 White Envelope Cuttings.... | 3.15 | @ | 3.25 |
| No. 1 Hard White. | 2.50 | @ | 2.60 |
| No. 1 Soft White.. | 2.05 | @ | 2.10 |
| Ledger & Writings.. | 1.30 | @ | 1.40 |
| Solid Books..... | 1.20 | @ | 1.25 |
| Blanks ..... | 1.40 | @ | 1.50 |
| Krafts ..... | .90 | @ | 1.00 |
| New Kraft Cuts..... | 1.70 | @ | 1.80 |
| Manila Env. Cuts... | 2.15 | @ | 2.25 |
| Ex. No. 1 Manila... | 2.15 | @ | 2.25 |
| Print Manila..... | 1.70 | @ | 1.80 |
| Overissue News..... | .60 | @ | .70 |
| Old Newspapers— | | | |
| No. 1 Folded News | .45 | @ | .50 |
| No. 1 Mixed Paper | .35 | @ | .40 |
| Roofing Stocks— | | | |
| No. 1..... | 2.00 | @ | 2.25 |
| No. 2..... | 1.85 | @ | 2.00 |

## TORONTO

### Paper

### Bonds and Ledgers

Delivered

| | | | |
|---|---|---|---|
| No. 1 White ..... | .35½ | @ | .36½ |
| No. 1 Tints ..... | .36½ | @ | .37½ |
| No. 2 White ..... | .26½ | @ | — |
| No. 2 Tints ..... | .27½ | @ | — |
| No. 4 White ..... | — | @ | .1550 |
| No. 4 Tints ..... | .16 | @ | .1650 |
| No. 5 Bond—White | .11.35 | @ | — |
| No. 5 Bond—Tints | .12.35 | @ | — |
| No. 5 Bond—Golden Rod ..... | 13.35 | @ | — |
| No. 5 Ledger—White | .1185 | @ | — |
| No. 5 Ledger—Tints. | .1285 | @ | — |
| No. 6 Bond—White | .10.75 | @ | — |
| No. 6 Bond—Tints | .11.25 | @ | — |
| No. 6 Bond—Golden Rod ..... | 12.75 | @ | — |
| No. 7 Bond—White . | 9.10 | @ | — |
| No. 7 Bond—Tints . | 9.60 | @ | — |
| No. 7 Bond—Golden Rod ..... | 11.10 | @ | — |
| Book— | | | |
| No. 1 M. F. ..... | 7.10 | @ | 7.35 |
| No. 2 M. F. ..... | 6.85 | @ | 7.20 |
| No. 3 M. F. ..... | 5.60 | @ | 6.20 |
| No. 1 S. C. ..... | 7.60 | @ | 7.85 |
| No. 2 S. C. ..... | 7.10 | @ | 7.35 |
| No. 3 S. C. ..... | 6.10 | @ | 6.35 |
| No. 1 Coated and Litho ..... | 12.50 | @ | — |
| No. 2 Coated and Litho ..... | 11.00 | @ | — |
| No. 3 Coated and Litho ..... | 9.50 | @ | 10.00 |
| Coated tinted..... | 13.00 | @ | 13.50 |
| Wrapping—delivered— | | | |
| Rag Brown..... | 4.85 | @ | 5.55 |
| White Wrap..... | 4.00 | @ | — |
| "B" Manila..... | 4.90 | @ | 6.25 |
| No. 1 Manila..... | 5.50 | @ | 7.00 |
| Fiber ..... | 5.50 | @ | — |
| Kraft, No. 2..... | 5.50 | @ | — |

(F. o. b. Cars, Toronto)

| | | | |
|---|---|---|---|
| News, per ton— | | | |
| Rolls (contract)... | 38.50 | @ | — |
| Sheets ..... | 45.50 | @ | — |

### Pulp

| | | | |
|---|---|---|---|
| Ground wood..... | 32.00 | @ | — |
| Unbleached Sulphite. | 59.00 | @ | — |
| Book (Class 1)..... | 71.00 | @ | — |
| Writing (Class 2).. | 72.00 | @ | — |
| Select (Class 3)..... | 73.00 | @ | — |

### Old Waste Paper

(In carload lots, f. o. b. Toronto)

| | | | |
|---|---|---|---|
| Shavings— | | | |
| White Env. Cut... | 2.50 | @ | — |
| Soft White..... | 2.15 | @ | — |
| White Blk. News.. | 1.25 | @ | 1.40 |
| Book and Ledger— | | | |
| Flat Magazine and Book Stock (old) | 1.00 | @ | — |
| Light and Crumpled Book Stock. | .85 | @ | — |
| Ledgers and Writings ..... | 1.20 | @ | — |
| Manilas— | | | |
| New Manila Cut... | 1.50 | @ | — |
| Printed Manilas... | .65 | @ | — |
| Kraft ..... | 1.00 | @ | 1.70 |
| News and Scrap— | | | |
| Strictly Overissue. | .65 | @ | — |
| Strictly Folded.... | .60 | @ | — |
| No. 1 Mixed Paper.. | .50 | @ | — |

### Domestic Rags

(Price to mills, f. o. b. Toronto)

| | | | |
|---|---|---|---|
| No. 1 White Shirt Cuttings ..... | .09 | @ | .09¼ |
| Fancy Shirt Cuttings | .03½ | @ | .03¾ |